No. .....

Elliot Memorial

GIFT.

Presented by

MRS. M. SCHUYLER ELLIOT.

Concord N. H.

TRANSACTIONS

OF THE

WISCONSIN

STATE HORTICULTURAL SOCIETY,

INCLUDING

ADDRESSES AND PAPERS PRESENTED,

AND

PROCEEDINGS AT THE SUMMER AND WINTER MEETINGS

OF THE YEAR 1878-9.

F. W. CASE, SECRETARY.

VOL. IX.

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LETTER OF TRANSMITTAL.

To his Excellency, WILLIAM E. SMITH,
Governor of the State of Wisconsin:

Herewith I have the honor to transmit to you the annual report of the Wisconsin State Horticultural Society, covering its transactions for the year 1878. By an act passed at the last session of the legislature, reorganizing the society, it was made the duty of the secretary to annually report its proceedings to the governor of the state. While the obligations enforced by this act do not strictly cover the year's proceedings contained in this report, the fact that the fiscal year of the society includes a portion of the year 1879, so that the report could not be made and published under the former law, will, perhaps, sufficiently account for what may seem an irregularity. This necessity, however, was regarded by the members of the society as very fortunate, as it enabled them at an early date to assume the position sought to be gained by this act, and to secure a more extended field of labor, and greater influence from a more intimate connection with, and a more complete representation of, the different parts of the state in its official management.

It will not be regarded as out of place to give here a few facts connected with the horticultural interests of the state, and the history of the society in its efforts to promote these interests.

To the early settlers of this portion of the Northwest, the abundance of the native fruits indicated a natural adaptation to fruit culture, and was one of the many inducements which led them to make this their future home. At an early date, vines, small fruits, and many varieties of apple, pear and peach trees were freely set out. For a number of years, owing in part to the great resources of the virgin soil, and to a fortunate escape from the extremes of climate which have since been experienced, these plants and trees made a thrifty growth, and coming early into fruitage, bore abundantly. This success gave a great incentive to fruit culture. Many more trees were set out, embracing nearly all the popular varieties of the country, and those made dear by the associations of home and early years. But a change came; the late fall growth of 1843, and the following open winter, with its sudden changes, killed to the ground some of the more tender varieties. For a number of years the trees that escaped injury bore good crops of fruit; then came a more sweeping destruction, and from that time on, disasters varied in form and degree have repeatedly occurred, and have been so widely extended in their effects as to destroy the faith of many of our farmers in the capability of the state for successful fruit culture, and to dampen the courage even of some who were once among the most sanguine of our fruit growers.

Nothwithstanding past reverses, there are still many who are laboring on, replacing the old trees as they fail, with hardier varieties, and are seeking to secure exemption from future losses by greater care and better culture. The losses incurred in the past have been severe, and there are many difficulties to be met and overcome, but to those who have carefully considered the situation, there seems to be no real cause for discouragement. We have a soil equal in variety, fertility, and natural adaptation to fruit culture to that of any state in the north and west; we have a surface extremely varied in its character, from which thousands of locations can be selected with special adaptation for raising different kinds of fruit. Our climate is stimulating in its effect, and under certain conditions is well adapted to promote a vigorous, healthy growth and abundant fruitage. The capabilities of both soil and climate are seen in the great variety and profusion of our native fruits, and in the large number of orchards scattered all over the state (except in the extreme northern portions), which are occasionally loaded with fruit, and which often bear fair crops. Also among these orchards we find instances where good crops, in the fruiting years, are the rule, and failure the exception; and in some, even tender varieties thrive, and are as vigorous and fruitful as in the localities where they originated. We also find that in most of the locations where serious losses have been encountered, there are one or more varieties in nearly every orchard that are doing at least moderately well, and give promise, that with better culture, they will prove hardy and productive.

When these facts are carefully considered, the difficulty seems to be not in lack of capability of soil and climate, but in a want of adaptation of varieties to the soil and climate, and of the means used, the ways and methods practiced in fruit culture; an ignoring of natural adaptation and limitation, to carry out personal preferences and theories. The history of fruit culture in our state may be divided into three periods, each characterized by different motives and methods. That of the early past, in which blind enthusiasm was guided by personal taste and fancy; this was followed by years of blind experiment, in which efforts were made to secure something better, something more hardy, by testing all varieties and arriving at the good by proving what was the reverse. This in turn is giving place to a period in which the principle of action is careful observation and close study of results, in order to secure perfect adaptation of culture and variety to conditions of soil and location. This is the method by which we are endeavoring to solve the problem at present. The answer, represented by the fruit product, is not the unknown quantity; that lies in the terms of the equation, and when they are discovered, success, we think, will be fully attained. To drop the figure, when we learn the conditions in soil, location, variety and culture, which contribute to the vigor and fruitfulness of the many instances of successful varieties and successful orchards in our state, thousands of locations can be found where the same combinations can be secured and accompanied by like results. We shall be able to go much farther, and by adapting variety and culture to soil and local conditions, will secure for nearly every township of the

state, if not an abundance of fruit, at least sufficient of various kinds for home consumption.

The cultivation of fruit is an interest of great importance, both in relation to the wealth and prosperity of the citizen and of the state and to the comfort and happiness of all, but there are many other subjects connected with horticulture of vital importance, and which have a close connection with the successful prosecution of many other branches of productive industry. Among them may be mentioned, cultivation and preservation of our forests; protection of our fields and homes with belts and groves of timber; beautifying of home surroundings and public grounds by setting out evergreens, shade trees and shrubbery; cultivation of taste and the promotion of the comfort and happiness of the family circle by encouraging the cultivation of flowers in the house and garden or lawn, and the dissemination of knowledge in relation to our insect friends and foes. The importance of these questions are now far from being appreciated; but a few more years of neglect will convince all of their value, by bringing upon us losses and burdens, hard to bear, and to escape from which will require great expense, and persistent, long continued efforts. Our citizens are not, perhaps, behind those of other states in their appreciation of the importance of horticulture, but the opinion is far too prevalent that it is a luxury to be indulged in only by those who have an abundance of leisure and means to gratify their tastes, and not by the farmer or men of small means. In the absence of productive returns in hard cash, the masses fail to appreciate the value it yields in promoting the health and comfort of themselves and their families; in increasing the value of their homes and farms; in its educating, civilizing effects in developing a love for the beautiful, and elevating the tastes of all who are brought within its influence.

The advancement of these important interests is the mission of the Wisconsin State Horticultural Society. From the commencement of its history in 1853, when the first organization was effected, as the Wisconsin Fruit Growers' Association, down to the present time, this work has been enegetically and faithfully carried on by a small band of practical and amateur horticulturists. They have not only given their time to this work, but have also borne the necessary expenses. The publication of their annual report by the state has been a great assistance in this labor, but aside from this, not a dollar has been drawn from the public funds to aid in its work or for its support. The members of the society, feeling that the amount of labor and the expense necessary to carry on this work had become too heavy a burden for its numbers and its means, and feeling that, as the end sought was the general public good, it should be sustained and carried on by the personal and pecuniary aid of the state at large, made application to the last legislature for an act of reorganization that would bring the society into more intimate relations to the state, and would secure the coöperation of a larger number of workers from the different parts of the field of labor, and also applied for the means to carry on the work more efficiently. The re-

organization was secured. The application for aid was in part granted. The amount asked for was an annual appropriation of $1,000; a special one for $600 was given. This was thankfully received, and will be accepted as a mark of confidence and trust in the society, which will encourage us in our work, and lead to special efforts to merit continued approval; but when the importance of the work, the amount of labor required, and the advisability of laying out definite plans of operation, and of carrying them out from year to year are considered, this amount must be regarded as inadequate, and the limitation to special provision, a contingency which will embarrass, if not entirely defeat, systematic, continued efforts.

Kindred societies, in neighboring states, with far less difficulties to overcome, with a much larger force of workers, and greater resources in themselves, have for years received special aid from their respective governments. Minnesota has bought a farm, and appropriated $1,000 a year to carry on experiments in fruit culture. The Iowa State Horticultural Society receives $1,000 a year from the state. The Michigan Pomological Society, $1,500, and Illinois has this year increased the amount previously granted to its State Horticultural Society from $2,000 to $4,000.

We do not ask means to carry out pet theories, or to favor individuals, or any particular class of citizens, but to promote the health, the happiness, the refinement and prosperity of all, and thus to increase the wealth and prosperity of the whole state. For this purpose, we would respectfully solicit the coöperation of all who are interested in the development of our resources, and that sufficient means be furnished to those who are engaged in this cause to do the work more thoroughly and efficiently.

Which is respectively submitted in behalf of the society,

F. W. CASE, *Secretary.*

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LIST OF OFFICERS, 1879.

PRESIDENT.

J. M. SMITH, - - - - - - - - Green Bay.

VICE PRESIDENT.

C. H. GREENMAN, - - - - - - - Wauwatosa.

RECORDING SECRETARY.

F. W. CASE, - - - - - - - - Madison.

CORRESPONDING SECRETARY.

A L. HATCH, - - - - - - - - Ithaca.

TREASURER.

M. ANDERSON, - - - - - - - Cross Plains.

SUPERINTENDENT.

D. T. PILGRIM, - - - - - - - West Granville.

STANDING COMMITTEES.

ADDITIONAL MEMBERS OF EXECUTIVE.

J. S. Stickney, Wauwatosa.
A. J. Philips, West Salem.
A. G. Tuttle, Baraboo.

NOMENCLATURE.

J. C. Plumb, Milton.
B. B. Olds, Clinton.
G. P. Peffer, Pewaukee.

OBSERVATION.

Dist.	*Dist.*
1st. D. T. Pilgrim, West Granville.	7th. D. Huntley, Appleton.
2d. J. C. Plumb, Milton.	8th. J. H. Felch, Amherst.
3d. Geo. Hill, Fond du Lac.	9th. A. J. Philips, West Salem.
4th. A. L. Hatch, Ithaca.	10th. G. W. Perry, Superior.
5th. E. W. Daniels, Auroraville.	11th. Hiram Smith, Sheboygan.
6th. C. W. Potter, Mauston.	12th. J. M. Smith, Green Bay.

MEMBERS, 1879.

Adams, B. F.	Madison	Wisconsin.
Allen, Prof. W. F.	Madison	Wisconsin.
Anderson, Hon. M.	Pine Bluff	Wisconsin.
Baumback, William	Wauwatosa	Wisconsin.
Case, F. W.	Madison	Wisconsin.
Daniels, E. W.	Auroraville	Wisconsin.
Freeborn, S. J.	Ithaca	Wisconsin.
Goss, B. F.	Pewaukee	Wisconsin.
Graves, W.	Brooklyn	Wisconsin.
Greenman, C. H.	Wauwatosa	Wisconsin.
Hacker, T. L.	Madison	Wisconsin.
Haight, Nicholas	Syene	Wisconsin.
Hall, C. H.	Neilsburg	Kansas.
Hambright, C. M.	Beaver Dam	Wisconsin.
Hanchett, Mark	Footville	Wisconsin.
Hatch, A. L.	Ithaca	Wisconsin.
Hill, Geo. C.	Rosendale	Wisconsin.
Hirschinger, Chas.	Baraboo	Wisconsin.
Holt, M. A.	Madison	Wisconsin.
Hoxie, B. S.	Cookville	Wisconsin.
Hunt, Samuel	Evansville	Wisconsin.
Kellogg, Geo. J.	Janesville	Wisconsin.
Lawrence, F. S.	Janesville	Wisconsin.
Lowe, Victor	Palmyra	Wisconsin.
Olds, B. B.	Clinton	Wisconsin.
Palmer, N. N.	Brodhead	Wisconsin.
Peffer, Geo. P	Pewaukee	Wisconsin.
Phillips, A. J	West Salem	Wisconsin.
Pilgrim, D. T.	West Granville	Wisconsin.
Plumb, J. C.	Milton	Wisconsin.
Plumb, T. D.	Madison	Wisconsin.
Potter, C. W.	Mauston	Wisconsin.
Reid, Wm.	North Prairie	Wisconsin.
Reynolds, Werden	Green Bay	Wisconsin.
Robinson, C. E	Portlandville	Iowa.
Smith, Alfred	Madison	Wisconsin.
Smith, J. M.	Green Bay	Wisconsin.
Steinfort, H.	Lake Mills	Wisconsin.

Stickney, J. S	Wauwatosa	Wisconsin.
Stone, I. N	Fort Atkinson	Wisconsin.
Thompson, H. M	St. Francis	Wisconsin.
Tuttle, A. G	Baraboo	Wisconsin.
Warren, A. A	Green Bay	Wisconsin.
West, J. R	Evansville	Wisconsin.
Whitney, A. R	Franklin Grove	Illinois.
Wilcox, E	Trempealeau	Wisconsin.
Williams, Daniel	Summit	Wisconsin.
Wood, J. W	Baraboo	Wisconsin.

HONORARY MEMBERS.

LIFE.

Dr. Joseph Hobbins, ex-President; F. G. S., Corresponding Member Royal Horticultural Society, England, Madison, Wisconsin.

O. S. Willey, ex-Recording Secretary, Benton Harbor, Michigan.

ANNUAL.

Dr. P. H. Hoy	Racine	Wisconsin.
Jonathan Periam, Ed. Pr. Farmer	Chicago	Illinois.
A. R. Whitney	Franklin Grove	Illinois.
A. F. Hofer	McGregor	Iowa.
Mrs. D. Huntley	Appleton	Wisconsin.
Mrs. H. M. Lewis	Madison	Wisconsin.
Mrs. D. C. Ayres	Green Bay	Wisconsin.

FRUIT LISTS.

APPLES.

Six Varieties, Hardiness Only Test.—Tetofsky, Duchess of Oldenburg, Hass, Wealthy, Fameuse, Plumb's Cider.

List for General Cultivation.—Tetofsky, Duchess of Oldenburg, Hass, Plumb's Cider, Fameuse, Walbridge, Red Astrachan, Utter, Westfield Seek-no-Further, Tallman Sweet, St. Lawrence, Willow Twig, Pewaukee, Wealthy.

NOTE.—The question of adaptation of varieties is one so largely dependent upon local conditions of soil, elevation and aspect, that a general list will not answer fully the wants of every planter, and at best can only be a general guide in the selection of varieties.

For more specific directions, the following rules and lists are furnished by the committee chosen for this purpose:

1. Locations comparatively elevated and well drained, with a cool northern aspect and fine gravelly clay soil, not very rich, may extend the general list named above to an indefinite extent, with fair prospect of success in southern and eastern districts of the state. But for warm, sheltered locations and rich soils, which induce a great growth, no section of our state can safely plant other than those varieties known to be extremely hardy.

2. The best guide in the selection of varieties is for each to plant largely of such varieties as are found successful in locations similar to that each must plant upon. For all unfavorable locations, and extreme northern districts, only the most hardy, well tried apples of the Russian or Siberian type should be chosen for general planting.

3. In the extreme northern districts, only the crown of the hills should be chosen for the orchard, with a firm soil and porous subsoil, and if these materials are wanting naturally, they should be supplied artificially.

GRAPES.

General List.—Concord, Delaware, Worden, Wilder, Agawam, Janesville, Lindley, Eumelan.

For Trial.—Roger's No. 3, Israella, Massasoit, Brighton, Champion.

RASPBERRIES.

For General Cultivation.—Miami, Philadelphia, Doolittle, also Fastolff and Brinkle's Orange, *if protected in winter.*

STRAWBERRIES.

For General Cultivation.—Wilson's Albany.

For Trial.—Charles Downing, Burr's New Pine, Boyden's No. 30, Arena, Green Prolific, Kentucky, Prouty's Seedling, Col. Cheney, Crescent Seedling.

PEARS.

For Trial. — Flemish Beauty, Ananas d'Ete, Early Bergamot, Bartlett, Swan's Orange, Seckel, Winter Nellis, Clapp's Favorite.

PLUMS.

For Trial. — Lombard, Imperial Gage, Miner, Magnum Bonum, Yellow Egg, Eldridge, Duane's Purple, De Soto.

EVERGREENS.

For General Cultivation. — Norway Spruce, White Pine, Arbor Vitæ, Scotch Pine, Balsam.

For Ornamental Planting. — Austrian Pine, Norway Pine, Hemlock, Siberian Arbor Vitæ, Red Cedar, Dwarf Pine (*Pinus Montana*).

For Timber. — European Larch.

For Live Fence Posts. — Norway Spruce.

ACT OF REORGANIZATION OF THE STATE HORTICULTURAL SOCIETY.

CHAPTER 151, LAWS OF 1879.

SECTION 1. The executive committee of the Wisconsin State Horticultural Society shall hereafter consist of the president, secretary and treasurer of said society, and of one member from each congressional district of the state; said members from the congressional districts to be chosen annually by the county and local horticultural societies in the respective districts.

SECTION 2. The present officers and executive committee of said society shall hold their respective offices until the Tuesday next succeeding the first Monday in February, 1880, and until their successors are appointed.

SECTION 3. It shall be the duty of the said society to aid in the formation and maintenance of county and local horticultural societies; to promote the horticultural interests of the state by the holding of meetings for discussion; by the collection and dissemination of valuable information in regard to the cultivation of fruits, flowers and trees adapted to our soil and climate, and in every proper way to advance the fruit and tree growing interests of the state.

SECTION 4. The annual meeting of the society shall be held on the Tuesday next succeeding the first Monday in February of each year, for the election of its officers, the transaction of general business, and the consideration of questions pertaining to horticulture.

SECTION 5. All vacancies in the offices of said society may be filled by the executive committee; and should there be a failure to elect a member of the executive committee in any district, the vacancy may be filled by a two-thirds vote of the members of the society present at any regularly appointed meeting.

SECTION 6. It shall be the duty of the secretary of said society to make an annual report to the governor of the state, of the transactions of the society, including an itemized account of all moneys expended during the year, in addition to such matters as are now specified in the law relating to the same.

SECTION 7. The number of printed pages of said report shall not exceed three hundred and fifty, and the number of copies shall be limited to three thousand five hundred. In all other respects, the publication and distribution of said report shall be in accordance with the provisions of the law now in force concerning the same.

SECTION 8. The sum of $600 is hereby appropriated out of any money in the state treasury not otherwise appropriated, to aid the said society in carrying out the provisions of this act; said sum to be paid by the state

treasurer upon the order of the president of said society in such sums and at such times as shall best contribute to the prosperity of the society and the interests it represents.

SECTION 9. This act shall take effect and be in force from and after its passage and publication.

Approved March 1, 1879.

CONSTITUTION AND BY-LAWS.

As amended February, 1879.

CONSTITUTION.

ART. I. This society shall be known as the Wisconsin State Horticultural Society.

ART. II. Its object shall be the advancement of the science of horticulture.

ART. III. Its members shall consist of *annual* members, paying an annual fee of one dollar; of *life* members, paying a fee of ten dollars at one time; of *honorary life* members, who shall be distinguished for merit in horticultural or kindred sciences, or who shall confer any particular benefit upon the society; and *honorary annual* members, who may, by vote, be invited to participate in the proceedings of the society.

ART. IV. Its officers shall consist of a President, Vice-President, Recording Secretary, Corresponding Secretary, Treasurer, Superintendent, and an Executive Board, consisting of the foregoing officers and additional members, one from each congressional district of the state, five of whom shall constitute a quorum at any of its meetings. In addition to the foregoing officers, the presidents of all local horticultural societies reporting to this society, shall be deemed honorary members and *ex-officio* vice-presidents of this society. All officers shall be elected by ballot and shall hold their office for one year thereafter, and until their successors are elected; provided, the additional executive members may be elected by the county or local horticultural societies of their respective districts.

ART. V. The society shall hold annual meetings, commencing on the Monday next preceding the first Tuesday in February, for the election of officers, for discussions and for the exhibition of fruit; also one meeting during the fall, for the exhibition of fruits and for discussions, and such other meetings for discussion and exhibition as the executive committee may direct, at such time and place as the executive board shall designate.

ART. VI. This constitution, with the accompanying by-laws, may be amended at any regular meeting, by a two-thirds vote of the members present.

BY-LAWS.

I. The president shall preside at meetings, and with the advice of the recording secretary, call all meetings of the society, and have a general supervision of the affairs of the society; and shall deliver an annual address upon some subject connected with horticulture.

II. The vice-president shall act in the absence or disability of the president, and perform the duties of the chief officer.

III. The secretary shall attend to all the correspondence, shall record the proceedings of the society, preserve all papers belonging to the same, and superintend the publication of its reports. He shall also present a detailed report of the affairs of the society at its annual meeting. He shall also endeavor to secure reports from the various committees, and from local societies, of the condition and progress of horticulture in the various districts of the state, and report the same to this society. It shall be the duty of the secretary to make an annual report to the governor of the state, of the transactions of the society, according to the provisions of the statutes for state reports.

IV. The treasurer shall keep an account of all moneys belonging to the society, and disburse the same on the written order of the president, countersigned by the secretary, and shall make an annual report of receipts and disbursements, and furnish the secretary with a copy of the same, on or before the first day of the annual meeting. The treasurer elect shall, before entering upon the duties of his office, give good and sufficient bonds for the faithful performance of his duties, subject to the approval of the executive committee.

V. The executive board may, subject to the approval of the society, manage all its affairs, and fill vacancies in the board of officers; three of their number, as designated by the president, shall constitute a finance committee.

VI. It shall be the duty of the finance committee to settle with the treasurer, and to examine and report upon all the bills or claims against the society, which may have been presented and referred to them.

VII. The standing committees of this society shall be as follows: 1st, Committee on Finance, consisting of three members; 2d, Committee on Nomenclature, consisting of three members; 3d, Committee of Observation, as now provided. Said committees to be appointed annually by the executive committee of the society.

PAPERS AND DISCUSSIONS

AT THE

SUMMER MEETING

OF THE

WISCONSIN STATE HORTICULTURAL SOCIETY.

Held at Baraboo, June 12 and 13, 1878.

The regular summer meeting of the State Horticultural Society was held at Baraboo, on the 12th and 13th of June, in accordance with the unanimous vote of the society, at its annual meeting in February, accepting the invitation of the Sauk County Horticultural Society to meet with them. The time was set, by the local society, at 2 P. M., at the court house, and the meeting was called to order by the president, who then delivered the following introductory address:

PRESIDENT'S ADDRESS.

By J. M. SMITH, of Green Bay.

Ladies and Gentlemen: When the members of the State Horticultural Society elected their president, none of them were thinking of summer conventions, or of times when it would be necessary to have a president who could be ornamental as well as useful; one who on occasions like this could deliver an address, and have it of orthodox length and filled with pleasant and agreeable thoughts, such as would be at least harmless to all, even if really useful to none. Feeling confident that I should prove an

utter failure in the ornamental department, it only remains for me to throw out a few hints that may possibly be of use to some few who may either hear or read them. But, before proceeding further, I wish, on behalf of our society, to thank you, one and all, for the kind reception we have received; for the kindly words of greeting that met us upon our arrival in your pleasant town. Some one has said that kind words are never lost, even though forgotten. To at least some of us, I am sure that your kind words and cheerful welcome will be neither lost or forgotten, but will remain with us as one of the very pleasant memories in the history of our connection with the state society. It is to be hoped, at least, that after our departure from among you, there will be no cause upon your part to feel that your kindness and hospitality upon this occasion have been either wasted or thrown away.

But if I can be of no service in the ornamental department, perhaps I may be of some little benefit to some few, either here or elsewhere, by pointing out a few of what seem to me to be the causes of failure of so many of our farmers in the horticultural, or what might better be termed, the home department of their farms. We may disguise the fact as much as we please, but a fact it still remains, that a large proportion of our farmers, even those who are in comfortable circumstances and are in reality good and successful farmers in other respects, fail here, almost entirely. In the first settlement of a new country almost all of the pioneers are people of very limited means, and it is an absolute necessity that they should devote their time almost exclusively, for a few years, to the sole occupation of getting a shelter for their families and themselves, and in providing for the necessities of life; in fact, in laying the foundation of a future home; and it is, in thousands of cases, a foundation where one of great beauty and value might be made if the proper exertions were made. In these cases no elaborate or expensive system of horticultural improvement can be expected. This is more excusable in such cases than in almost any others; yet even here, much might be done without money, or at least, with but very little of it. It requires some time and some extra labor; but as a general thing our farmers in the northwest are by no means indolent. Why, then, is not a beginning made even in the early days of the farm? One reason is that our people value their homes too lightly. They intend to sell out and go west.

A friend of mine moving west nearly twenty-five years since, purchased a small place and built a house; but year after year he obstinately refused to set out shade trees, fruit, or flowers, or even to sod his front yard. He said it was of no use, he did not intend to stay there. He wanted to sell out and go elsewhere. Yet he remained there more than twenty years, and had it not been for the efforts of an excellent wife, his place would have been a house, but not a home, for the whole of that time. This class of farmers seem to me to be both unreasonable and selfish. They will do nothing that will benefit those who come after them, and in this respect are like the Irishman who declared that as posterity had never done anything for him he would never do anything for posterity.

Another class includes many of those who succeed upon their farms, and expect to remain on them; but if one of them has a farm of one hundred and sixty acres, and is doing reasonably well, instead of improving it, and making home beautiful and pleasant, he begins to wish for another, or perhaps two more quarter-sections that lie near him. After he gets his four hundred or five hundred acres he is no better satisfied than before, but thinks he needs enough to make a thousand-acre farm. Instead of being satisfied with this, his one thousand acres is, as he thinks, only the nucleus around which he is anxious to get a farm upon which he can do business upon a grand scale. Will this man, with his immense farm, and his mania for more land, stop to set out a few fruit trees, or flowers, a strawberry bed, and other small fruits? Will he devote time to making lawns and gravel walks around his home? He has no time for this. His herds of stock, his large and magnificent fields of grain occupy his time to the exclusion of everything like the little plat about his house. Sometimes such work seems to him childlike and foolish. The son of one of this class married a very refined and excellent young lady, and, wishing to please his wife, although he occupied a portion of his father's farm, commenced to set out shrubbery, small fruits and flowe rs; his father came along while he was doing it, and ordered him to cease and go at something else; he would have no one upon his farm spending his time in such a foolish manner. A few years since I visited a farmer of this class upon business. I consider him one of the best farmers in the northwest. After concluding my business I started toward his garden. He called to me, saying: "You need not

go there, for you cannot get through it, or even into it, on account of the weeds." His words were almost literally true. The weeds were from two to six feet high and as thick as they could possibly grow. He had about seventy-five acres of corn, and I have not a doubt that there were more weeds upon one-half an acre in his garden, or upon the spot where he was supposed to have a garden, than could be found upon the whole of his corn field. In these cases, and there are many of them, not only among our large farmers but among those of more moderate circumstances, it is not only a want of time, but a false idea that a man can be better employed than in spending a portion of his time in such a manner that it will bring no cash return. During the cares and the labors of the days and the weeks, there seems to be no time to spare for anything except the actual care of the farm; and in this way the years roll on, until at length even the taste and the desire for a beautiful home have passed away. Old age comes on, accompanied by a fine farm and plenty of means, and yet that family has never known the comforts and pleasures of a pleasant and happy home, one adorned with such beauties and comforts as every farmer in even moderate circumstances might and ought to have.

There is another class of farmers who always intend to have a fine garden, with plenty of fruits, flowers, shrubbery, shade trees, lawns, etc., but they are not quite ready to do it yet. They cannot even commence such a work this spring, but they fully intend to do it at some future time. If such a one should be induced to plant a garden and take a few steps in this direction, the probabilities are that in the fall following, the garden would be a good place in which to hunt rabbits, except for the fact that it would be nearly or quite impossible to follow them through the mass of weeds and rubbish with which it would be covered. As a general rule, the farming of this class of men will be a little in advance of their gardening, still it will be far from good. They work hard and really intend to do what is in their power to have a pleasant home; and if they had the right kind of neighbors and surroundings, they would often succeed in making a pleasant and a pretty home.

There is still another class of farmers, who not only always fail to have a pretty home, but likewise fail to have good crops or a good farm, or at least to have them for any considerable length of time. If they live near a town or village, you will almost surely find them

in it on rainy days, evenings, and very often in fair weather. If it is cloudy they think it will certainly rain, and will not begin a day's work. If it is hot, they can not endure so much heat. If it is fair weather, they must go to the blacksmith's, or wagonmaker's, to get some tools repaired. They are invariably behind with their work upon the farm; and as to setting out a few rose bushes and ornamental plants for the hard working and discouraged wife at home, or setting out and keeping in order a little plat of strawberries, raspberries and grapes, such things would be utterly beneath their dignity. There are certain empty dry goods boxes at the street corner, in the village, that would never get whittled into shavings, and certain loungers about them who would never hear their latest complaints about hard times, bad luck, poor seasons, etc., if they should fool away their time at such nonsense. I wish to have a due amount of charity for all; but I fear that the mantle is hardly broad enough to shelter this class from utter contempt. I do not know what either you or I can do for them. They are failures upon their farms, failures in their homes, and failures everywhere.

Still, after deducting all these classes, there remains a large body of farmers in our northwest, who are making homes of beauty and happiness. Theirs are homes of intelligence and worth. Homes that are the pride and glory of our country. To them we must look for our principal support, both now and in the future. From them must come the cultured ones to make other homes beautiful and happy. When we can, either individually or as a society, add to the number of such homes, or do somewhat to add to the beauty and happiness of those that already exist, we are conferring a benefit upon our country, and upon common humanity. If by our exertions we could induce any large number of the classes that I have named to change and improve their present home, we should indeed be conferring a boon of great value upon our country. Can we do this? Can we not at least do something toward it? We may at least try to make our own homes such as a poet has so pleasantly described:

"More than building showy mansions,
More than dress and fine array;
More than domes and lofty steeples,
More than station, power and sway.
Make your home both neat and tasteful,

Bright and pleasant, always fair;
Where each heart shall rest contented,
Grateful for each bounty there.

"There each heart will rest contented,
Seldom wishing far to roam;
Or, if roaming, still will ever
Cherish happy thoughts of home.
Such a home makes man the better,
Sure and lasting the control;
Home, with pure and bright surroundings,
Leaves its impress on the soul."

FRUIT PROSPECTS. — At the close of the president's paper, reports of the fruit prospects in the different parts of the state were called for.

Mr. Tuttle, of Baraboo, stated that for the first time in an experience of twenty-five years in fruit raising, had the crop been destroyed by spring frosts; the apple crop is nearly a failure; grapes on low ground are much injured, but are good on elevated sites; in some places plums are little injured; in others they are killed; strawberries, raspberries and currants promise an abundant yield; pears seemed to have suffered less than the apples. The frost was quite peculiar in its effects, doing, in places, much damage to the hardiest varieties, while those much tenderer were almost exempt from injury.

Mr. J. S. Stickney, of Wauwatosa, reported that fruit along the lake shore was apparently in a much better condition than in other parts of the state. The frost had injured the foliage of the trees, even killing it on many of the larger trees and on crabs; generally the foliage was not over half what it ought to be, and its growth seemed to be wholly checked; the trees were full of apples and will give an abundant crop if the foliage develops sufficiently to mature them; pears are better than apples, and better even than last year. There are but few trees, but they are well loaded. The foliage of the Early Richmond Cherry was injured, but the trees are full of fruit, while on the Kentish variety, the leaves are good, but the fruit is injured; currants will be only a half crop; the fruit first set is all right, but the lower half of the stem was nearly killed; at first it was thought that little or no harm was suffered by the strawberries, but the early blossoms were killed. As the season

has been favorable, a late bloom was developed and there is a good prospect of a respectable crop. There are but few plum trees in that section; of these, the cultivated varieties are well loaded with fruit, while the wild varieties were much injured by the frost. Grapes bid fair to yield a good crop, and the raspberries were never better. The advantage of elevated locations was clearly shown by the effect of the frost on Mr. Greenman's grounds. His land is about fifty feet higher than other places around, and though there was a slight appearance of frost, not the least injury was done, even to tender plants.

Senator Arnold said that in the northwestern part of the state all the fruit except strawberries had been killed, with the exception of a few places along the Mississippi river; there the high elevation and the warm air from the river protected it; even the wild plums and crab-apples were all killed, Transcendents and all.

Mr. Clark, of New Lisbon, gave a discouraging account of the effect of the frost in his section. Crab-apples all killed; grapes also, with a very few exceptions; strawberries wintered well, but will yield one-half or one-third of a crop; currants and gooseberries stripped by worms; apples all killed except occasionally a Talman Sweet and a few other trees with a little fruit on.

Mr. Plumb and Mr. Palmer, from the southern part of the state, reported a general destruction of the apple crop, except on the high grounds; cherries are a small crop; plums an entire failure, and the trees nearly ruined by the frosts and the green aphis.

President Smith gave a very encouraging report of the fruit prospects at Green Bay. Grapes were injured somewhat, but apples, pears, crabs, and the small fruits generally, promised a full yield.

Mr. Hirschinger, of Freedom, said some of the orchards in his section were injured in the foliage and in fruit, but there was a prospect of considerable fruit. With him Golden Russet and Rawle's Janet were unharmed, while the other hardy varieties were injured; currants would be only a partial crop, but the other small fruits never promised better.

Hon. A. A. Arnold, of Galesville, read the following paper on

HORTICULTURE ON THE FARM.

Among my earliest recollections are those of the little bureau, in which my mother placed my clothes each week, after they were washed, ironed and mended, and in which I also kept my playthings, arranged as I desired, with the advice of my mother. Also the little garden father gave me to till, in which I raised the different kinds of vegetables that my father raised in his; kept and arranged also as I saw fit, with the advice of my father.

Well do I remember the pride I felt in showing how my garden looked, and the approving face of my dear, good mother; how I would hoe it over, and then go to my mother and call her out to see it; how she would often say that it looked better than father's big garden; that my melons were larger than his, or that my tomatoes were thriftier; and then, when we had anything from my garden on the table, and we had company, mother would often say, "This is some of Alexander's raising." What a pride I had in all this!

When fourteen years of age, I was made head gardener, and after that, when mother would say, "Well, Alexander, when are you going to make garden?" or, "How are you going to arrange this or that?" and other questions of the kind, that, of course, indicated to me that I knew as well as any one what was best to be done. This gave me confidence.

To that little bureau I trace my love of order and hatred of disorder; the disposition to have a place for everything, and everything in its place. To that little garden, much of my love of home, and a taste for agricultural and horticultural pursuits. Do you hink that all this little trouble by a mother to train correct habits, trying to instill refined tastes, is spent in vain? Some will not take the trouble. Some think they have broader ideas; they desire to elevate the race. They don masculine manners, and set to scolding everything and everybody. They proclaim the errors of law and public sentiment; everything is out of joint. It is for them to mount the rostrum, or enter legislative halls, and bring order out of chaos — wise legislation where now all is corruption. A few short years spent in rearing a family is a waste of time. They were not born for this, for God made a failure when He made man,

for all the morality, and honesty was put in the female part of man's creation.

If there is anything in me that is good; if I have ever had any noble promptings, any ambition to be useful to my fellows, the first great cause and source of it all, I attribute to a mother's early training. These little recollections of her, and her manner of training me, teach me how to be patient, and how to lead my little ones along; teach me as I could not otherwise have been taught, how to give them their early education. My early recollections of home were the most pleasant. Here was the large farm well tilled, the convenient and well arranged house and out-buildings, the ample orchards of both early and late fruits. The peach, plum, cherry and pear orchards, with quite a variety of each. The long rows of currants, gooseberries, the kitchen garden, the early potato and sweet corn patch, the rhubarb, horseradish and asparagus patches, the great large door yard with so many flowers and such a variety of trees and shrubs, the beautiful fountain, the arbors and the gravel walks. I helped to make many of these. I grafted many of the fruit trees. I budded mother's roses and her orange and lemon trees. I did more than any other, beside father, to help her make that dear old home attractive out of doors. In the language of Holmes:

"There are no times like the old times,
May they never be forgot;
There is no place like the old place,
Keep green the dear old spot,"

But why all this? I tell it because I cannot otherwise so well impress the fact, that home training, home lessons, are the lessons that determine the tastes; and that, whatever we desire most in the man or woman, must be begotten or instilled in early youth. As it is these little home surroundings, the training of our childhood that creates the taste, it is for this I make the personal reference to myself. I have seen many more elaborate and better arranged gardens, lawns and pleasure grounds, than in my old home, but none so interesting to me. Better that, with its imperfections, or any other with it, than a home with no horticultural improvements. We all know what sort of an opinion we have of the home that has none of these surroundings. The passer by remarks, "That man has no taste." "I wonder what kind of a wife he has." "Where

has he lived all his life?" "I'll bet he is an old heathen," or "I wonder if they have not all got the scurvy." "What comfort there." "What can they do to spend their leisure hours." "That's the way these farmers live, they have no taste, and I wonder not that the girls hate to marry farmers."

How different the conversation of the passers by, where there are nice yards and good gardens. "That man must be a thrifty fellow." "Oh! look, see the flowers, and such a garden!" "I'll bet his wife is a smart, tasty, neat little woman." "Suppose we stop and take tea," and like remarks. We will form opinions of others from their surroundings, and where's the use of our making all the world believe we are rude and uncultivated, when perhaps we have the best of hearts, and it is only thoughtlessness or an undue regard for some other object, often not half as worthy. We like the esteem of our fellows, and we have gone very low when we may honestly say that we don't care what others think of us.

There are many young people about to start in life in this new country. I would say to them, get a home as soon as possible, and make this home *your* home. In your middle life and old age, if you are not appreciated among those with whom you have spent your early years, you may never expect to be elsewhere. Select your building spot, and if not able to build such a house as you would like to live in all your days, build a small one adjoining these grounds, and one of these days build the larger house on the interest of the money that it would have cost when you first started. Embellish the grounds; at least, set out the evergreens, for it takes some years for them to make a nice show. There is nothing that makes a place look so attractive in winter as these. Set out your orchard, plant the shade trees by the roadside; anything that it takes much time to mature don't put off longer than you can help; then you may get some tangible benefit from it before you die. Two acres of land devoted to orchard and garden, planted to varieties suited to our climate, will supply any ordinary family, if well cared for, with all the vegetables and most of the fruit it will require in the year, causing but a trifling outlay to the nurseryman and seedman; and the expense of cultivation, if well arranged in long rows so as to admit of horse culture, will be but a trifle over a field crop; and how pleasant to sit down to a table never complete without some tender, juicy vegetables or luscious fruits thereon. Nothing

assists a housekeeper better in setting a good table than a good supply of fruits and vegetables. Potatoes everyone has, cabbages most, but it is less common among farmers to have always on hand, beets, turnips, salsify, celery and other roots; and if they have them, they are too often kept in poor condition, and consequently laid aside as worthless before the end of winter, and the owner takes little pains another year to raise what has proved of so little value. Good, airy cellars, and careful storing are essential in keeping vegetables for family consumption. Good farmers will seldom think of wintering their stock without some roots; and still we see numerous families through our land, that have but few or no vegetables in winter, unless it be potatoes, cabbages or onions. I could not raise a first class short-horn without some green food in winter, and I would consider myself a beast if I undertook to raise my children with less thoughtful care for their digestion, their growth and permanent health than I gave my dumb brutes.

Gardens must be cultivated, trees must be planted, pruned, mulched and dug about; care and attention must be given. Nothing can be had without these. One of the ways to make a farmer poor is to purchase and plant fruit and ornamental trees, and by planting flower and vegetable gardens and then not give them one-half the care and attention required, with the expectation of first-class fruit and vegetables, thus wasting their money, their time and their seeds. It is not worth while to invest in anything that you have not the time, the means or patience to properly care for. Nurserymen, gardeners and professional horticulturists do not need reminding of the proper season for performing the various operations on the fruit and vegetable grounds. Always on the alert, they are ready to do everything at the most favorable moment. We farmers must needs be mere amateurs, and as advice is best received from one of our own class, I venture to say my little say, for I feel that could I write what I do not know on my subject, it would be a vastly better paper. We cannot spend but a small portion of our time in the garden or fruit yard, still there are many hours and days that we may be profitably employed in the yard and garden with our help and not neglect the fields. There is no excuse for not having a good garden. I have my opinion of any man that has none. Wealthy men in our cities are not satisfied unless they have fresh fruit and vegetables from their own grounds. People of

less means but good livers in our towns are sure to supply their tables from the markets; but we farmers who have plenty of land, plenty of means and lots of muscle, often feed on hog and hominy, when we should be eating strawberry shortcake, tomatoes and cream, or apple dumplings.

The Germans are patterns in this regard; their gardens furnish one-half their living. They always have vegetables on their table, and can you show me a healthier people.

The practical gardener has some peculiarities of taste, a method of speaking, and a delicacy of touch as unlike or distinct from those of other people as are the manners of the old schoolmaster or the physician; and there must be few students of human nature that have not noticed the several peculiarities of people in the several occupations. In any of these, when the tendency is toward health and refinement, it should be encouraged. Then, if the tastes and habits, the health and physical development, the intellectual and moral culture are all conserved by horticulture, why shall not we farmers be practical and blend it with our business as fully as the profit and general policy of the two occupations will admit? Where is the use of being a farmer unless for the benefits? To neglect nearly all the advantages and still continue a farmer is to make a fool of oneself. Surely it is a slow way to get rich; the benefit of country air, country scenery, luscious fruits, and nice tender and fresh vegetables, a beautiful home, and all in the way of our business, with no material outside expense, and enjoy the advantages of proper surroundings where we may raise our children, are among the farmer's privileges; to neglect anything that goes to complete this farmer's home, this home for our children, and still live on a farm, is to make life a failure.

At the conclusion of the reading of this paper, President Smith stated that there were many cases where large farmers, who boasted of their skill, the extent, the quality of the yield of their broad acres, had not even an apology for a garden; whose lawns or door yards were unadorned, or worse, grown up with weeds or brush. As a general rule, farmers' gardens are very unsatisfactory, yielding but little to the comfort of the family.

Senator Arnold had noticed that as a class our farmers were of a stout and robust frame, and could relish pork and potatoes day by

day; their out-door labors gave them strong constitutions and a hearty digestion, but many of their wives were feeble and of poor health, and could not relish such a diet. They craved and needed different food and more of a variety. Were the farmers to raise an abundance of fruit and vegetables, it would do much to remedy this evil; for without them, owing to the feeble constitution and nervous temperament, induced by indoor labor and constant care, many of our farmers' wives drag out a weary life.

Mr. Stickney thought it would be beneficial if all our farmers could read and consider the subject presented in Senator Arnold's paper. The general practice in this matter was all wrong, yet there is something to be said in excuse for the farmers. They have many cares; the general farm crops are their main dependence; success depends on these being pushed to the utmost, and receiving constant attention; while the pecuniary results derived from horticultural products are small, and hence are neglected in the hurry of other work. Many who know the home value of fruits and flowers, year after year do without them, by neglecting to get trees and plants and to sow the seeds at the proper time; it is their intention to do it, but when the time comes the pressure of the regular farm duties crowds it out of mind, or there seems to be no place for it, and as the season for this work is short, it passes unimproved. Here is room for horticulturists, and those who, by experience, know the value of these things, to do a missionary work. A rose-bush, a few strawberry or flower plants, a tree or shrub, and seeds presented to such, and in fact, to many farmers, would perhaps lead to an advance in this direction, and tend to develop a taste and love for these things.

Mr. J. W. Wood said it would be well to consider this subject from the farmer's standpoint. He had followed farming for quite a number of years, and had taken special pains to provide an abundance of fruit, vegetables, etc., for home use, and it had been his experience that to do it successfully, much labor and constant vigilance was necessary, and often, even with these, failure would occur. If the corn and wheat or other farm crops failed, all was gone, for it is on these that the farmer depends for his living; while a failure in horticultural products does not bring such disaster; hence the first must receive the greatest and best care, and the other generally suffers for want of the constant attention which is

necessary to success. His experience has been forcing him, though unwillingly, to adopt the conclusion that fruit raising should be left almost wholly in the hands of professional cultivators. Currants usually have been a sure crop. Last year they failed, and the present season the crop will be very light; what was left by the frost will be taken by the worms. So it is all around, with plums, pears, apples, etc.; they require such care and attention to grow them successfully that the general farmer cannot give it. He has no time to give the proper cultivation, to destroy the numerous insect enemies to whose attacks they are constantly exposed. The difficulties in fruit culture seem to be on the increase, especially the insect foes. They have become so numerous and persistent as to make it necessary to scatter poison with both hands to repel their attacks.

President Smith stated that with him the currant crop had not failed once in twenty years; it was as certain as the summer was to follow the winter. At first, worms appeared on the bushes, but he bought a hen and brood of chickens and kept them in the yard with the currants, and had not been troubled with them since, while his next door neighbor's bushes, with only a fence between, had been often completely stripped of leaves and fruit by them. He had found poultry a sure remedy for insects on the currant bushes. The yard in which his currants grew was given entirely to the hens, and they dug around and under the bushes, keeping out the grass and weeds, and devouring all the worms, bugs and insects in the active or chrysalis state. Had not been troubled with the hens destroying the currants; they were fed regularly and had plenty of green stuff to eat.

Mr. Tuttle said, no matter what crop we grow, we have got to give it proper care and attention from the time the seed is put into the ground until it is harvested. Farmers expect this, and know they will fail if it is not done; but with fruit, many of them seem to think that all that is necessary is to set out the trees and plants; this done, there is little need of anything else except to pick the fruit, and should this fail to grow, they are discouraged and think it is useless to try to raise it. On the contrary, where we give it the proper care and secure the requisite conditions, it is as sure as any other crop; much more so than wheat. He had failed a dozen times in raising wheat where he had once on his apples. There

were twenty-five trees on his place that have given better returns each year than the average of any twenty-five acres in farm crops, and he would rather have them to-day than twenty-five acres of farm land. Anything we raise must receive the necessary attention; and if farmers would give the same care and attention to fruit they do to corn and wheat, they would be successful. We have the chinch bug, the Hessian fly, the cut-worm, the potato beetle, etc. These must be watched and destroyed; so with the insect enemies of our fruit. The difficulties are not peculiar to us, but are found everywhere. At the east and south many complaints are heard; they say they cannot compete with the west in raising fruit, and in a few years will have to wholly depend on us for it.

Mrs. Irena H. Williams, of Madison, then read the following paper:

"RUN YE NOT AFTER STRANGE GODS."

The spirit of the age seems to be love of a change, and for some reasons it is well; for others it is falling off from the good old ways of those who preceded us, by which we are not the gainers, but rather suffer loss. This is a fruitful theme, but only as it applies to floriculture will I glean.

In a family where the love of plants is an innate taste, early spring brings to mind the necessity of quickly preparing a list of the variety, and quantity of seeds and plants, needed to make beautiful the home garden. Wise men first came from the east, and to this day their wisdom is in high repute, so, to the catalogues from their establishments, we turn. What an array of slumbering beauty does the seed here described present, but the dear little flowers of childhood "are lost to sight, tho' still to memory dear," and in their places we find elaborate, high sounding, meaningless names with such wonderful descriptions, that we no longer recognize the old friends, and rather sorrowfully write new names, thinking, ah well! we too must keep pace with this age of progress.

The plant list is more bewildering, still the botany of girlhood has somehow slipped away amidst the stern realities learned since. We are nonplussed indeed; at random the selection is made. High prices and high-falutin names go hand in hand, but we think with so much concentrated loveliness, Solomon in all his glory would

be quite insignificant in comparison with the beautiful things so soon to be ours. Air castles have a way of falling, and on the arrival of coveted beauties ours often have crumbled. One novelty, *Panicum variegatum*, looks as if the name had crushed out the life and all desire of it; and I would have quite as soon plucked a handful of ribbon grass from an old fashioned garden, and trailed that from my vase, for that, at least, would look as if it lived, and intended to. Another plant which was described as having long, delicate, graceful drooping sprays, proves to be something suspiciously resembling wild rushes, which might take on a drooping nature were a weight tied to each stiff stem. Next, a plant which, from the price, we expected the size to be such as to make a showy center piece for a large flower bed, alas! on being unrolled, a tiny specimen mocks us, and only by a deal of persuasion is made a good sized plant for the next season. Again, we read of a stately, beautiful, lawn plant, which should be in every well appointed garden. It had a very imposing name; it came and was planted; the only attraction it appeared to possess, was for the wasps which congregated there to rush out upon the unwary. A Lombardy poplar would have been quite as suitable. They sprang up in countless numbers to try and take full possession, bidding defiance to hoe and spade, and still continue to. A glowing description of a plant well adapted for hanging baskets, again attracted my fancy, which proved to be a miserable specimen of a striped verbena, which our home florists could scarcely give away; but then they all came from the east, and perhaps that ought to be glory enough, even if they do lack other necessary qualities. In like manner with the seed. We sow *Ipomea tri-color nova;* hope and wait patiently for the plaudits which our flower-loving friends will give. How astonished and gratified they will be! But where we looked for a delicate trailer, up comes a vine, coarse, and rather familiar looking, and soon its rampant growth and well-known blossoms say, morning glory. This is beautiful in its place, but not just what we would fancy for a lawn vase. Hollyhocks, and sunflowers too, have their appropriate positions, but are not pleasing out of them, even though we do not call them *Althea Rosea* and *Helianthus.*

Here let me say, please do not judge me to be of that non-progressive order known as old fogies, who still long for the good old days when the grain was cut with a pen knife — or was it a sickle?

For have I not been the victim, when I strove to be progressive; have possessed little plants and long names? I know the wheat and cheat grow together for some one to winnow. There are many of our new additions that are truly valuable, worthy of all praise; but do not let them crowd out the flowers of our childhood. I would not see them forgotten, or have our children know them not. The asters, lady slippers, four o'clocks (which all the little ones love), the dainty sweet pea, mignonette, China pinks, scarlet lychnis, evening primrose, the modest, shade-loving nemophila, and — shall I own it? — ragged robin, and many more which space forbids even mention.

Phlox drummondi, though not as old as others, ought to be highly prized, and found in every garden. To my taste, they are more pleasing than verbenas; not visited by insects or disease, coming into bloom when not more than two inches high, and blooming long after all else has succumbed to the frost. There is now almost every shade of color; they look well anywhere, and the blossoms, when cut and placed in water, remain fresh much longer than those of any other flower. To you, lover of high-sounding names, I bequeath all the *variegatas*, *grandiflora*, *florapenas*, etc., but give me the sweetness and beauty of the good old flowers, for there are times when, instinctively, we turn to the face of an old flower, as to an old friend, for comfort and sympathy; the sight and perfume of them bringing happy memories, like strains of almost forgotten music, wafting one back to other days, when we ran not after strange gods.

Injurious Insects. — The question, "How to Secure the More General Destruction of Injurious Insects," was then taken up.

Mr. Stickney said, that for the currant worm, he had found white hellebore very effectual. They had a number of acres set to currants and gooseberries, and before they discovered this remedy they frequently lost their whole crop by these worms; thus suffering a loss of at least $300 a year. Now they made an extensive use of white hellebore. Last season they bought one hundred and fifty pounds of it. It is good for the destruction of the rose slug and other insects. They keep it done up, ready for use at any time when the foe appears. The method of applying it found most convenient, is to put it into sacks made of double thickness of mosquito

netting; sacks holding about a quart are the most convenient size, filling them about half full of hellebore and plaster in equal parts. These may be fastened to short sticks and the bushes dusted with the mixture while they are wet with dew, rain or by sprinkling. It is better to take a still day for the application, to prevent loss of the fine powder by the wind; also be careful to keep the windward side of the sack, as the sensation produced by the powder in the eyes and nose is not very pleasing, though perhaps not seriously injurious. He would not hesitate to use it on bushes loaded with fruit, but would wash the fruit carefully before using it, especially if the powder had not been washed off by rain. It might also be applied by sifting with a large size pepper-box. One application may not be sufficient, and two or even three may be necessary. The worm is three brooded, and if not all destroyed by the first application, those left will send out another brood. A pound of hellebore would be sufficient for use on bushes usually cultivated by an ordinary farmer.

Whale oil soap has been recommended and used extensively for the destruction of worms and insects, but it was disagreeable to handle, disfigured the foliage and was not always efficient. The great trouble with us is, not that we do not know of remedies, but that we will not use them. We read of remedies, we see what others can do with them, but we fail to apply them ourselves. For years our plums have been eaten up by the curculio, and we have been deprived of this fruit, not because it was necessary, but because we would not use the remedy within our reach. No one need lose his plums. The never getting about the destruction of the insects is the great trouble. When once commenced the work of destruction becomes interesting and is readily followed up. Five minutes to a tree, two or three times a week for three weeks, will preserve the fruit from this pest. He uses a light frame, 6x6, covered with a cotton cloth, having an opening on one side, to allow it to be spread around the tree, with the trunk in the center; lap the edges of the cloth over the slot left for the body of the tree to pass through, so as to cover the ground completely; then jar the tree suddenly and the little Turks will drop on the sheet. He uses a light stick with a rubber bunter on the end to jar the tree with. Many who make a practice of jarring their trees year after year, bore a small hole into the body of the trees, drive a sharp bar of

iron with the ends cut off square into these holes, and then jar the trees with light blows with a hammer. If this jarring process was faithfully followed up for a few years, we would save our fruit and exterminate the foe. This is rendered much more certain by the fact that the egg is not deposited by the curculio until some days after he makes his first appearance. The fruit is often stung earlier, but the egg is not deposited until the plum is one-third or one-half grown.

Mr. Plumb remarked that insects were very numerous the present season; great damage was being done throughout the state by the canker worm and leaf roller; in many sections whole orchards were being ruined by them, and they had already destroyed much of the fruit which was left by the frost. On the University farm, in Madison, the foliage and fruit on whole rows of apple trees had been destroyed by the leaf roller; other trees were nearly stripped of leaves by the canker worm. He found both of these insects were doing great damage in this section. He had brought specimens of two kinds of worms that were at work on friend Tuttle's orchard, one the old canker worm, a small, dark-colored looper, known everywhere as the regular canker worm; the other a larger worm, also a looper, with yellow stripes along the back. This was not usually found on fruit trees, but was now destroying the foliage and fruit of the orchards through our state. Various methods have been tried to destroy these insects. The one most commonly used is to encircle the body of the tree with a band or trough covered or filled with tar or some other sticky substance, and thus to entrap the wingless female moth as she progresses up the tree to lay her eggs. To make this a sure remedy it is necessary to keep close watch, and often to renew the liquid used, so as to prevent its being hardened or bridged over, so as to allow the moths to pass up. Hatching out as they do at different seasons of the year, from early spring until fall, it requires long and close watching to make this effectual. A better method is to shower the young leaves soon after they appear in the spring with a solution of arsenic. If done at the right time and in the proper manner one application will be sufficient. Mr. B. B. Olds, of Clinton, has found this an effectual remedy, killing the worms in a large orchard with it. The cost of the material is very light, and the expense lies mostly in the labor required, but this is not great, for when the preparation is once

made, a good active man, with a garden pump and hose attached, will sprinkle the trees very rapidly. Five minutes will be sufficient for the largest of trees. The preparation is made by taking a pound of arsenic to sixty gallons of water; in one or two gallons of water mix the arsenic, boiling it about twenty minutes, and then mixing it with the rest. While being used, it should be stirred occasionally, as the arsenic settles to the bottom of the liquid, and will scorch the foliage. This preparation is better than Paris green and less likely to injure.

Whale oil soap had been tried by some, but was far from being efficient. Mr. Plumb also spoke of the great damage usually done by the codling moth, but said that he had not seen any harm done by them the present season. This may be the result of the light crop of fruit last year. If there were a general effort made to destroy this moth, in two or three years we should be nearly rid of them. The more familiar we are with the habits of these our enemies, the better we are able to meet them. The egg from which the first brood of worms is hatched is deposited in the apple soon after it has set. On maturity it leaves the apple, crawling down the tree, or letting itself down by a web (seldom falling with the apple), and seeks some sheltered place to enter the chrysalis state. By placing a band of cloth or paper around the body of the tree, a convenient place will be furnished them which they will take advantage of, where they can be easily killed. These bands should be examined twice a week and all the worms destroyed. Vinegar had been used to attract and drown them, but the bands were the most successful.

Mr. Tuttle thought the moths could be caught much more readily in shallow dishes of vinegar than in any other way. He tried it last season, at the time the second brood of moths appeared, and caught more in a single dish in one night than with bands in a whole week. Had put out his dishes this spring, but caught no moths; there were no moths, or it was too early for them. In reply to a question whether it would not answer as well to put vinegar in bottles suspended in the trees, Mr. Tuttle replied that he thought wide dishes much preferable, as he had caught a much larger number in them, in proportion, than in those that were deeper and of small surface.

President Smith had used Paris green with success in preventing

the depredations of cut worms in his strawberry bed. Last year these worms destroyed many of his plants, eating off the leaves soon after they started out in spring. He sprinkled the beds with Paris green, using one part to fifty or sixty of plaster. Had tried the same remedy this season just before the blossoms appeared, and had not been troubled with worms. He regarded the hens and birds as great helpers in the destruction of our insect enemies.

Mr. Stickney thought that the benefit derived from hens and birds, was largely due to their destroying the insects in their chrysalis state, and thus preventing a large increase in numbers. Mr. Smith's hens were confined to the yard containing the currant bushes, and when insects matured and entered the ground they hunted out and destroyed them.

In reply to an inquiry in relation to the benefit derived at the east from the English sparrow, it was stated that at first they rendered great assistance in destroying the canker worm in eastern cities, but they soon acquired a taste for other food, which they found in abundance, and that but little benefit was derived from them now in the destruction of injurious insects. They had become regular scavengers in the cities, and when crowded by numbers out into the country had proved destructive to crops. It was the general impression at the east that "their room would be much preferable to their company," as by their quarrelsome disposition they had driven off the song birds, whose company was more pleasing, and whose aid in destroying insect foes was equal to, if not greater, than that of the sparrows.

It was also remarked that much was being accomplished by the destruction of the nocturnal moths, most, if not all of whom are our enemies, by putting out lights at night. A lantern placed on a block in a pan or tub of water, will draw to it many may-beetles, moths of the leaf worm and caterpillars. No pains should be spared in destroying them in this manner.

Society adjourned.

SOCIAL AND FESTIVAL.

In the evening there was a very pleasant and social gathering at the parlors of the Presbyterian church, in connection with an exhibition of fruits, flowers and vegetables. The cheerful greetings and kind attentions of the citizens of Baraboo made the occasion

one of more than ordinary interest and pleasure. The parlors were beautifully adorned with evergreens, flowers, house plants, and the smiling faces of the ladies of Baraboo. The refreshment tables bore witness to the generous hearts and skilled hands of those who had prepared the feast, and the liberality with which the luxuries were dispensed bore with them satisfaction and good cheer.

June 13th. The day opened with the brightest of suns, and with the pure mountain air of those bluffs was most auspicious for the excursion to Devil's lake, which had been arranged by the local society, and at eight o'clock two carriages steamed up the mountain valley to Kirkland, where, by the courtesy of the proprietor, N. C. Kirk, the morning session was held in the spacious pavilion at that famous summer resort. J. S. Stickney read a paper on "The Production of New Varieties."

PRODUCTION OF NEW VARIETIES OF FRUIT.

BY J. S. STICKNEY, WAUWATOSA.

You will not expect from me an elaborate and exhaustive treatment of the subject of new varieties; first, because time would not permit; second, because it would be neither entertaining or profitable; and third, because I could not possibly do it. If I can present a few thoughts that will interest you, and lead here and there an individual to investigate and experiment, it will, perhaps, be placed to our credit as time well spent.

President Smith, in calling for this paper, inquired earnestly for the "coming strawberry." Well, in a general way to fully satisfy the public expectation, it must be immensely large, say about the size of an average pineapple; its flavor must be a high concentration of sugar, sweet cream and strawberry aroma; color, bright and attractive; texture firm — perfection in this last point would enable the producer to market it in bags, something like the present style of apple marketing. Its habit of growth must be luxuriant, enabling it to suppress grass and weeds without the aid of hoe or cultivator. Perhaps this standard is a little high, but we read in the special circulars, introducing new varieties, near approaches thereto, and these statements are substantiated by many strong

testimonials. Having gone thus far who shall dare limit our possible attainments? My great trouble has been to get actual sight of what I read so much about. When President Smith gets within tasting distance, he will of course consider it his official duty to notify us all by telegraph.

You will agree with me that this ideal berry would be a great acquisition; perhaps some of you will commence earnest efforts for its production. If you succeed, your fortune is made, *sure*. But in our prospective success let us not forget the good things already gained, and let us not fail to get the greatest possible good from them. In the Wilson we have size and productiveness, capable of yielding two or three bushels per square rod. We also have great firmness, enabling us to handle easily and ship long distances, or carrying it through a day or two of rainy weather, without serious loss. We call it *sour*, and with some reason, yet much of that fault may be overcome by letting it thoroughly mature before gathering. I know of no other that will carry its fruit one or two days after fully ripe without loss, and being thus ripened it will hardly be recognized by those who have only used it as soon as colored. Free and liberal use of sugar is said to improve its flavor. In this mixture the acid and the sweet are so mingled and blended as to add greatly to the interest of both. Most palates take to it kindly from the first, and all are convinced after a few trials, that the Wilson is not only endurable but really a pretty good treat to set before one's neighbors and friends.

In Green Prolific, Boyden, Prouty, and others, we have excellence of quality, size, vigor and fair productiveness. In several varieties we have great vigor of plants, immense size, good quality, but only moderate production. I think, say ten of our most valuable kinds give us materials with which to produce market crops which will please the consumer and pay the producer; materials, also, with which to get up a very pleasing exhibition, to laden a show-table with plates of fruit that will stimulate not only the desire but the firm resolve of each beholder to produce on his own grounds an abundance of the same, and to show the enthusiastic amateur visions of future crops, which by his special care and skill shall far exceed the present. We have heard of the spirited exhibitions of the English gooseberry-growers. Gooseberry exhibitions are not practicable with us, but it seems to me that this first

fruit of the season, sought and freely used by all, so easy of culture, so varied in character, yielding such quick returns, is the first above all others to stimulate our enthusiasm until a meeting like this shall call in scores or hundreds of exhibitors, with bushels instead of quarts of fruit.

The strawberry blossom is excellently adapted for cross fertilization, and by this process, it seems within the reach of the skillful gardener to unite the good qualities of the different varieties, adding to the firmness and productiveness of the Wilson, the size of our largest, and the flavor of our best. This accomplished, and you have the coming strawberry. If you fall short of this, you still have a pleasant occupation, yielding something desirable in fruit, and instructive relaxation for a leisure hour.

A pleasing feature of this strawberry culture is its simplicity. Plants for a square rod are but a handful; bought for a half a cent each; sent five hundred or a thousand miles safely and cheaply by mail; planted easily and quickly; in almost any reasonably good soil, in fifteen months thereafter yielding abundant harvests of fruit. The poor laborer on his rented acre or village lot, may, if he will, compete with, yes, win prizes from him who owns a hundred or thousand acres.

The lady who needs and appreciates out-door exercise, when once fairly enlisted will find invigorating employment, for mind as well as body. The lad of ten or fifteen may cultivate his five, ten or twenty kinds, and in their culture learn lessons that will be useful in the growing of larger fruits, and in farming. The delicate school girl may compete with her strong brother, and her patient painstaking will often win the prize.

While we would gladly welcome any improvement in our strawberries, it seems to me that there is greater need and better prospects for improvement in some other fruits; for instance, in our much neglected currant. Are we satisfied with its present size and quality? What say you to a new currant half an inch in diameter, in clusters four to five inches long? Would it not be a fortune to its owner and a valuable addition to our horticultural wealth? Who of us has ever grown a young currant plant from seed? If grown, was it from seed gathered hap-hazard, or was it carefully produced by removing the stamens from a blossom and then fertilizing with the pollen from another variety?

This would be a sure, but painstaking way to mingle varieties; another way is to plant two or more kinds in the same hill, then by training and pruning so interlace the branches as to make a mingling of blossoms very probable; then save and plant all the seed therefrom, and from the young plants select the most promising. A thousand plants so raised and fruited might yield ten, five or one that would be an improvement on the old — a slow and tedious process truly; yet it is by similar patient efforts that we have received from Van Mons our choicest pears, from Knight fine cherries and other fruits, from Rogers and Rickets excellent grapes, and from Boyden valuable strawberries.

Another fruit — entirely at home here — miserably poor and valueless in its present condition, I believe to be susceptible of *very great* improvement, and of being made a source of luxury and profit. I refer to our native plum, abundant in all our groves; hardy as an oak, wonderfully fertile, with no enemy except the curculio, yet allowed to run entirely to waste, simply "cumbering the ground." Is this as it should be? Do you believe we are doing the best we can as horticulturists while we allow a fruit with so many good points to remain so utterly useless? Will anybody sympathize with us because we can't enjoy choice Gages and Golden-drops, when we make no effort to aid ourselves, not even taking the trouble to select and transplant the best from the woods. That we may select some of the best, and by giving good culture make them yield abundant crops which will bring remunerative prices, is doubted by none. That we *can* and *ought* to produce from those something better and in greater variety seems equally plain to me. By this good work whose name is to be placed with those already mentioned?

The united efforts of a county society and a state society are not required to get up an excellent strawberry show. It may be better done by the county society alone, or by a township society. A single school district could do great things; or the members of a family could make a showing which would bring out sharp competition, and be a source of pleasant amusement and profit. To cultivate and encourage this interest as applied to strawberries and roses, is largely the mission of these summer meetings of our state society. Owing to difference in time of blooming and of ripening, in widely extended territory, the state society can add little or

nothing to the showing made by a local society. This is not our hope, but we do hope that the discussions and facts brought out at this meeting will induce not only leading members but every member of this county society to begin here, and now to make earnest and definite plans, looking to an annual strawberry and rose show, each one of which shall be better than its predecessor, and yet only faintly shadowing forth the excellence of those to come after it.

GARDEN REVELATIONS.

BY MRS. H. M. LEWIS, MADISON.

Oh, the summer, the beautiful summer! How dear it should be to us all, with its fresh green leaves, lovely flowers, blue skies, balmy air and joyous birds! Let us live in the present, and enjoy each day of it, for it will too soon pass away!

"There is no price set on the lavish summer,
And June may be had by the poorest comer.
And what is so rare as a day in June?
Then, if ever, come perfect days;
Then heaven tries the earth if it be in tune,
And over it softly her warm ear lays.
Whether we look, or whether we listen,
We hear life murmur, or see it glisten."

How kind of God the Giver to have made this earth of His so beautiful! Why did not He make it a desert, and create man with no capacity for the enjoyment of His beautiful creations? But, no; He has created man but little lower than the angels, and He has made a world full of astonishing beauty, mentally and spiritually; and if man will but study it, love it and enjoy it, in the right spirit, it will not have been made for him in vain.

One beautiful, fine morning when all nature was overflowing with joy, beauty and gladness, I heard a long-faced, sorrowful man pray to God that He would close his eyes forever on the beauties of nature. Methinks such a man unfitted for heaven; he could not enjoy heaven were he there, for God intends us to measure heaven by the world He has given us here, and He loves this world of His.

"'Tis man's own sickly blunders make the world deformed alone;
Who know it most, see beauty most; who know it least, see none."

The poet truly tells us, "there is a lesson in each leaf," and if we but open Nature's book to read her secrets, what a mine of wealth and knowledge is before us to cheer us in the dreary pilgrimage through life, for

"Nature never did betray the heart that loved her."

A traveler once asked Wordsworth's servant to show him his master's study. The servant replied that he would show him his master's library, but his study was out of doors in the garden. Let us, this early spring morning, refresh our senses by a pleasant walk as we go arm in arm through Wordsworth's study, the garden, and perhaps we, like Shakespeare, may "find tongues in trees; books in the running brooks; sermons in stones, and good in everything."

As we inquire into the mysteries of the plant life that is so abundant about us, perhaps we may discern, to us, some new truth, which Leibig says is adding a new science; but we cannot expect to fully comprehend and fathom nature's mysteries, for that is the lesson to be learned in the myriads of years yet to come.

The first object of interest that greets us is the apple tree, for it seems to have had the most ancient and mystical history of all trees, as it made its advent upon earth before man, and, when man did appear, it was the means of getting up the greatest revolution the earth has ever known. The apple is mentioned often in the old testament. Solomon says "stay me with flagons, comfort me with apples;" and again, "As the apple tree among the trees of the wood, so is my beloved among the sons." The apple has migrated from the east to the west with man, and it still goes marching on. It can truly be called the most healthful, useful and delicious fruit grown.

In 1836 in the horticultural garden of London, more than 1,400 varieties of apples were exhibited. The number of varieties in our country even exceeds that. Probably hundreds of apple trees in what is now known as Ohio, Illinois and Michigan, owe their origin to an eccentric individual commonly called Johnny Appleseed (Jonathan Chapman), who in 1801 transferred in two canoes, lashed together, on horseback, and on foot, bushels of apple seeds from the cider mills of Pennsylvania to the frontier. The lone traveler stopped at every inviting spot to plant the seeds, traveling

hundred of miles on foot, forgetting pain and weariness in his work for the coming man. There is an inexpressible charm hanging over the eventful history of the old apple tree, and we love to linger in its atmosphere, and, as we accept the proffered seat under the shade of its branches, a voice is heard to say: "See what a living tree I am: I have my season of growth as well as of rest; I have the power of selecting from mother Earth the elements for my healthy growth. Millions of invisible pumps are drawing food and drink for my hungry mouths. I am using my forces silently, but I have within me a power more mysterious and powerful than the mighty Corliss engine. Understand and explain by what means I carry nourishment from the earth to the topmost bough. Ah man! that is a secret, a something you can never fully understand. My 300,000 leaves, with more than a billion pores, are my lungs; these I use for exhaling and inhaling the gases surrounding me. In the fall, I pack most carefully and orderly the new leaves, blossoms and fruit into a tiny trunk for the coming spring, then give again to mother Earth the leaves she has loaned me for my summer's use, for her future needs, and I drop into a sweet, long winter's sleep, but my great heart still beats and my circulation goes on languidly, until my mother says, 'Arise and shine, my children, and rejoice with me, for the season of rest is over and gone;' and I put forth my tender leaves and beautiful flowers, so delicately tinted and perfumed that they delight the world. After I have gladdened you in the early spring time, I drop my petals like gentle snowflakes around me, and the growth of the fruit expands and ripens upon my bough, until at last it is touched by the soft and unseen pencil of nature with tips of gold and shadows of crimson; and when you pass by me in the cool of the evening, you shall breathe an atmosphere so delightful and refreshing that the very gods envy me. Am I not, dear one, the apple of thine eye?"

The sugar maple, with spreading bough and dark green, glossy leaf, is the near neighbor, and we listen as it says: "Man can learn the true laws of architecture from me; please examine my symmetrical structure, graceful form, lines of beauty and airy grace; also the firm foundation on which I stand. I send out millions of fibrous roots that penetrate the earth in every direction. Some of them plunge down so far that they reach never failing springs. This water sustains and invigorates me through the dry

season, and if you would make a thorough examination of my virtues, thrust an iron into my side early in the spring before frost is gone, and witness the throbbing and beating of my pulses as my sap ascends. Have I not been gathering sweets from the earth for my summer needs? Catch my delicious juices if you will, and analyze them, you will find there crystals as pure and beautiful as those of the diamond. Very early I put out my scarlet leaves and tassels, and some members of my family shower down beautiful winged, lace-like seeds of scarlet and pale green before the leaf is half grown.

While conversing with the maple tree, we spy an English ivy clinging to the bark, which we try to disengage, but in vain, for it seems to have become a part of the tree. My companion exclaims, "What can this mean? roots growing out of the ground? I thought roots were made to grow in the ground." The ivy sweetly replies, "My dear, these aerial roots enable me to climb bush, stone and castle wall, and when I have established myself, they hold me as firmly in place as if I were planted in the ground." Then we spoke of Washington's old church in Alexandria. My friend says it has become a bower of lovely green. At one time an effort was made to exterminate it, as the roots were growing into the cement to such an extent that the building was in danger of weakening. But cutting it off at the ground was of no use, for the vine would not yield until the cement did, and in despair the effort was abandoned. Dear old ivy, stand firm; hold fast; and when the walls crumble and fall to the ground, you shall go with them to beautify the ruins with your drapery of fresh, bright, living green.

The study of vines with their various ways of growth is most instructive and interesting. We will stop for a moment to examine the vines growing in the rustic hanging basket. First the Maurandia with its delicate, little, heart-shaped leaf, we find growing upwards, over the handle of the basket, even into the trees, as it inclines only to an upward growth, and clings to the support by the leaf stalk. If, perchance, we oblige it to grow over the side of the basket, it constantly holds out beseeching hands to us to lift it up. But the Lineria inclines only to a downward growth, and finds its true place only as it falls over the basket. The rustic hanging basket alone is revealing to us many mysteries of plant life, and as we study it, we are astonished and delighted at the workings of na-

ture for she varies the arrangements of growth, as if to show us that she will be "fettered by no rule." The Galium, bed straw, or goose grass is spied nestling down among her more cultivated companions. Let us listen to her rustic story. "My home is in the wild woods, and I delight in cool, shady spots. If you wish me to climb to the top of the basket just give me a slight support, and train me upright; if over the side, to cover the basket, just divert me downwards; either way I am content. My leaves grow in whorls and are very rough; if you examine the end of the leaf you will find there a sharp curve or hook; by these I climb. My jointed, four cornered, rough stalk, also assists me as I rise. My very small white flowers are borne in clusters, and if you will arrange them with showy companions, like water lilies, I am sure you will be pleased with me, for at a distance I resemble mist. Many, many years ago, thrifty matrons and blooming maidens perfumed straw beds with me, therefore the name bed straw which is commonly given me." Over the side of the basket the striped, purple and green-jointed Tradescantia is hanging. Let us examine it critically. We first discern that the stem is hollow, and that it is filled with water. This enables the plant to live months without soil or moisture. It is in fact almost an air plant. The purple in the leaf unconsciously discloses the color of the flower, telling its own little secret, as the majority of plants are doing each day, and what a pleasure to discover these precious little secrets.

We regretfully leave the lovely vines, climbing up or creeping down, as inclination and habit dictate, and pursue our studies.

Hark! I hear a feeble voice saying, "Brethren, whatsoever things are true, whatsoever things are lovely, whatsoever things are of good report, if there be any virtue, and if there be any praise, think of these things, and remember that God made nothing by accident or in vain; everything is made and controlled by fixed laws, and there is good in all things. Look at me as I grow in the gravelly walk under your feet. I am meek and lowly, but useful. I have some characteristics that my showy neighbors envy me. I can foretell what the weather of the day will be, and I have many pleasant visits and chats with the merry school girls. When you see my blossoms fully expanded, you may be certain of a sunshiny day; but if in the morning I hold down my head, and refuse to open my eyes, defer the picnic until another day, and take the

umbrella with you, for you will need it before night. Try me, and prove me, for the Chickweed is the soul of truth and honor."

As we enter the summer house the California Sedum is discovered by my friend, whose interest now is greatly awakened as the little plant relates its own history. "I belong to the stone crop family, a family that delights in growing over old walls and stones. I was fastened to this lattice two months ago by my mistress, and in a few days I delighted her with signs of life, for I began to develop my tiny plants on the edges of the leaf. Slowly the work went on, until three perfect plants, with roots, leaves and stem appeared, that are now objects of great wonder to all beholders. Some old people avoid me because they believe I am drawing my nourishment from the animal life surrounding me, but they are mistaken, for the elements of my growth are obtained from air and moisture."

My friend inquires of the Agave (American Century plant) if that too is of use to mankind, when it boldly steps forward, bristling with thorns, and makes the following characteristic speech: "I am one of the tropic's favorite sons. You seem to forget how deeply you are indebted to the tropics for the beauty of your green house and garden. I thrive and enjoy most perfect life where it would be suicide for others to attempt to live. Nature has refused to give my family of five hundred species beautiful forms of body, but we are content, as she has more than compensated us by giving us the most beautiful flowers in the vegetable kingdom. Some of my family have caught the glory of the flame, others the rosy sunset, and again some reflect such a pure, tranquil beauty that we could almost fancy it akin to the moon. Nearly all my family develop the full blossom about midnight; therefore we are looked upon with superstitious awe in the east; and one of my family is planted as a symbol of the resurrection when the dead is laid away. The multiplicity of curious flowers in my family exceeds imagination. Some creep upon the ground, others live upon trees, and some varieties are trees themselves. We are at home in the desert where no other vegetation is found; at the mouth of the volcano; in the low valley and on the mountain top, sometimes mounting to the line of snow. And one of my family makes its home in Wisconsin, even growing as far north as Lake Superior. Many varieties have edible fruits, as delicious as figs. Of myself, individually, I can say when I reach an advanced age, anywhere from twenty to seventy,

I send out an immense stalk crowned with thousands of blossoms, and my work is done, for my life is ended. But I hear your inquiries as to my uses. If you open my long, thick leaf, you will perceive that it is filled with hundreds of fine fibres, as fine as the spider's web. If the leaves are macerated, these fibres are converted into fine thread that will make lovely lace, strong twine, thread, hammocks, etc.; paper is also manufactured from the leaf. If the traveler is without water, he can pierce my leaf and obtain enough to satisfy his thirst. If the cattle are hungry, the leaves can be cut into slices and fed to them, and they will have an appetizing meal. If the innermost leaves are torn out, juice will flow for a year or more, which, by inspissation, yields sugar, but which, when diluted with water and allowed to stand for a few days, becomes the agreeable but intoxicating drink of the Mexicans called *pulque*. Mexican Indians not unfrequently sacrifice both fortune and life to obtain it."

Our journey through the garden, like all other pleasant things, must end, and we bid you a reluctant good bye, hoping that the little ramble of the morning may benefit by giving us a new taste of nature's sweets, uses and beauties. The poorest laborer who enjoys his garden, in full sympathy with the objects of nature about him, is seldom unhappy, for he can have lovely trees, fruits, flowers, and green pastures; riches can add but little more. And the magic of the cheerful laborer's spirits will light up his face with a radiance never seen on the face of a millionaire; for beauty can be made to come as gladly for love as for money.

The very name of garden charms us with its dear old associations and memories. Let us remember that the garden was created in perfection on the very morning of creation. It was in the garden that the Lord walked in the cool of the day. It was there that he fainted. It is also hallowed as the chosen resort and repose of the Messiah, scene of his passion, place of his sepulchre, and witness of his resurrection.

2 P. M.

The society again met at the Court House, shortly after the return from the lake. President Smith called up the question, What are the best

FERTILIZERS FOR FRUITS.

He thought careful experiments on this point would be of great value. More attention is being given to the subject of fertilizers now, than ever before. Different elements and compounds are being tried, and the best method of application. He had lately given more attention to this subject. His main dependence had been, and still is, the compost heap, but he had been trying lately to manufacture phosphates out of bones obtained from a slaughter-house, by dissolving them with acids, ashes and hen manure; when fully dissolved, puts in dry earth to take up the excess of moisture and make it more suitable to mix with the soil. In this way he expected to get a strong fertilizer, and one that would have a marked effect on the soil for a number of seasons; should try it on his strawberry beds when in bearing, and anticipated large returns.

In reply to an inquiry as to the treatment of his strawberry beds, he said that he made a practice of giving thorough culture and a heavy coat of manure. In preparing the ground for a bed, he commenced in the fall, by putting on twenty loads or more of manure to the acre, turning it under, plowing deep; in the spring, before setting out the plants, he manured it again, using fine, well rotted manure. This he harrowed in, mixing it thoroughly. The first season he cultivates often, keeping the soil loose and free from weeds. Late in the fall, he mulches the beds, putting on about an inch in depth, of light, dry covering, usually pine leaves or old hay. The covering should not be so thick or of such a character as to keep the plants very wet, as this will cause them to rot. In the spring he rakes off the mulching and gives another coat of fine manure, twelve or fifteen loads to the acre.

Information was asked as to whether corn stalks and bagasse were suitable for winter protection. Mr. Tuttle stated that he had used cornstalks to cover his vines last winter with very good suc-

cess. They furnished sufficient protection for the vines, in winter, and in the spring the vines grew up through the stalks, and seemed to have greater vitality and vigor than when covered with anything else. He had tried various methods of covering; had used oat straw and raised more oats than strawberries the following season; had also tried old clover hay and harvested a good crop of hay from the beds instead of berries. He was satisfied that cornstalks and marsh hay were the best things we could have for covering. The first season, he would leave the stalks on the beds; they would protect the vines from the drought, and also keep the fruit clean. After the first crop was harvested, rake off the stalks and let the vines cover the whole ground.

President Smith said he did not try to raise a second crop of berries where the first crop was a large one; if from any cause he failed to get a good yield the first season, he let the bed stand the second year. It seemed absurd and cruel to turn under strong, healthy looking vines, but his experience had been that a heavy crop of fruit exhausted the vitality of the plants, so that the succeeding one would be deficient in number and in quality, the berries small and imperfectly developed. This is especially true of the Wilson. Some of the new varieties seem to have greater vitality and may yield two or three crops before becoming exhausted.

Mr. Tuttle reported that a number of the new kinds were much stronger growers than the Wilson, and would probably yield paying crops for two or three seasons. He was much pleased with the appearance of the Red Jacket, a new berry from Iowa. Also with the Crescent Seedling. While at the east in 1876, he saw beds of the Crescent, three and four years old, which appeared very strong and vigorous, and were bearing good crops.

Mr. Kimball stated that he had tried refuse sugar cane to cover his beds with, and never had more flourishing vines or a larger crop of berries.

Mr. Palmer had not tried bagasse on strawberries, but he was satisfied from experience, that there was nothing better for the winter protection of grape vines.

Mr. Plumb, of Milton, read the following paper on

CONSERVING OUR FRUITS.

With the increasing production of fruit in this state, comes the very pertinent inquiry as to the best means of conserving the same so that, in seasons of plenty, they may, by inexpensive methods, be kept in their natural state, beyond their ordinary seasons of maturity, to fill up the gap, and give us our home grown apples and small fruits, in their luscious freshness, out of season as well as in.

Careful estimates place the cost of importing fruit to our state at one and one-half to two million dollars annually. Whatever it may be, much of this expense would be saved to the state, if in seasons of abundance, we had some really efficient means of saving the surplus for future use. For instance, the apple crop of our state is estimated at 264,238 bushels annually, three-fourths of which are autumn apples that largely go into the cider mill at fifteen to twenty-five cents per bushel, when, if they could be carried through until winter, they would bring double that price, and be a thousand fold more valuable to the community, in the form of sauce. The same is largely true of our grapes, and less so of other small fruits.

In my child home were but three methods of conserving fruits, beyond their natural limit in the fresh state, namely, by drying, in sauce, and preserves. The first was done mostly by paring, quartering, coring, stringing, and poling; the second, by boiling down the juices, and adding the fruit for sauce; and the third by the pound for pound process. The automatic paring, coring and slicing machine was not invented. "Apple bees" were occasions of much frolic in our New England kitchens. The telegraph was then unborn, but an apple seed could carry some messages as well. Canning was not then known, but the barrel of boiled cider and "apple butter" filled a large place in domestic cooking.

We now have improved machinery for drying, and canning facilities which enable us to secure larger quantities of fruit with less labor and expense. The kitchen is supplemented by extensive factories; the use of glass self-sealers in the household, and the tin

can in the factory, carry fresh fruits of the most transient kinds through all seasons and to all climates. With all these facilities and the immense increase of fruit plantations, the price of fruit has steadily advanced during the last fifty years in our country at large, beyond that of any other of our staple products. Within my observation of forty years, good winter apples have advanced five to eight hundred per cent. in market value, in western Massachusetts. I have seen the finest quality of winter apples sold there for one shilling per bushel, all hand picked and nicely assorted, and thirty-five years later the same quality would bring seventy-five cents to one dollar per bushel in the same market, and all this while the area and quality of fruit growing had increased beyond the ratio of population. The fact is evident that the consumption of fruit is much more a necessity of the every day diet of this feverish, fast age, and when once established, cannot be safely denied. Hence the demand is increasing beyond all present sources of supply, both from home consumers and foreign export.

Concerning the foreign demand President Wilder, of the American Pomological Society, says in his last biennial report: "The foreign market for our fruits is now as well established as that for our wheat. Australia and Germany will consume immense quantities of dried fruits, but England prefers fresh fruit. From October, 1876, to July, 1877, there was shipped to foreign ports 396,000 barrels of apples. In the month of December alone, about 90,000 barrels were sent to a foreign market, prices ranging from $3.50 to $10 per barrel in the English market.

The canning process has been brought to great perfection, and that of drying promises to be of greater utility when at its utmost development, reducing the weight and rendering it transportable to all climes, and readily preserved for years. Statistics of this business as a part of our national industry would be very desirable, but nothing definite has as yet been secured. Six firms in California employ two thousand women and children, and turn out two million dollars worth of canned goods annually; and of dried fruits alone, seventy-five tons were turned out in 1876 by the Alden company in that state. New Jersey receives over a million dollars annually for the product of her peach crop, and has now immense *dry houses* in which the surplus crop is saved for the markets of the world. The mountain regions of east Tennessee and north

Georgia are becoming famous for the product of fruit, which is largely dried for market. Oregon and Washington are also becoming famous for their dried plums and prunes, as well as apples.

For dried fruit the foreign demand is rapidly increasing. There were exported during the year ending June 20, 1861, the amount of $269,000; in 1871 it was $509,000; while for the year ending June 30, 1877, it was $2,937,025, the amount of dried fruit being 14,318,052 pounds, and of preserves and canned fruits, mostly peaches, $762,344 worth. This foreign demand for our dried fruits is on the steady increase, and must continue as long as any surplus remains beyond that necessary for home consumption.

But any possible figures on foreign demand are feeble to express the amount of fruit consumed in American households, and yet with all our improved methods of saving, do we not waste frightful quantities of fruit in years of abundance? This is true not only in the older countries, but to a large extent in our own state. A full crop finds us with no adequate facilities or preparation for its most economic disposal. I have seen in one orchard in Jefferson county, one hundred and fifty bushels of Fall Stripes suffered to drop from the trees and fall into partial decay, and lose at least three-fourths of their value before gathering, and ultimately sold at the cider mill for one-half the price they would have brought, if seasonably gathered (hand picked), and sent to markets where there was a demand for them in their season. I have also seen the finest quality of winter apples carefully picked and stored in unventilated cellars or rooms, to become death struck and unfit to eat or keep. I have seen good wholesome apple juice allowed to become "hard cider" in the farmer's cellar, and as such, worse than thrown away, in its ultimate effects upon the perverted appetite and vitiated morals of the family. This "waste" is not confined to apples alone, for in the handling of our small fruits how much is wasted for want of more perfect system and plans for gathering, storing, keeping, or marketing, and by forcing the market, to the great loss of the producer.

The Apple. — Of all fruits this is king in Pomona. The "winter apple" is one which does not naturally mature its juices until cold weather, and hence, if kept at an even, low temperature after picking in autumn, may be kept indefinitely. So if we pick our fall apples before fully matured and place them in a win-

try atmosphere at once, they will become "winter apples" soon as the winter comes. This accomplished, they will have double or treble their selling value, simply by keeping for a winter market.

That this is entirely feasible has been shown by repeated and well-known demonstration. Several patent processes are now in use, the secret of all being a low, even temperature, with the proper degree of moisture for a given variety, so that neither evaporation nor saturation of the original juices may occur in the keeping quarters. The total exclusion of atmospheric changes, except through sub-earth ventilation, seems likely to be the most feasible plan for fruit houses, but the ventilation must be thorough or all will be lost. For the average farmer, low sheds, heavily thatched with straw extending to the ground, and the fruit room partly excavated or below ground, will be found a great aid to the keeping of fall and winter apples for a period of one or two months before severe weather, or even all winter if secure from frost. Utter darkness and quiet, as well as good ventilation and a cool, moist air, are needful for safe keeping of apples. The Russets have a very porous skin, and so will wilt in a dry air from evaporation where a Fameuse will keep plump. The Russet should therefore have a moist and rather cool atmosphere, and is generally better for barreling at once when gathered.

No amount of after care will compensate for careless handling of fruit or prolong its keeping when fully matured. The apple and pear should be carefully gathered by hand before fully matured, when firm and not fully ripe, and put away at once in close quarters. If carefully assorted when picked, they should not be handled over again until put into the market, and better not then, unless absolutely necessary.

I cannot recommend too highly the use of the bushel box or crate for the use of all choice apples. Two ten-inch boards, seven-eighths of an inch thick and ten inches long, form the ends. The sides, bottom and top are made of common pine lath cut in two once and nailed all round with lath nails, except the bottom with four-penny. You have here a crate twenty-two and one-quarter inches long, ten inches wide and ten inches deep, inside measure, which will hold one bushel even measure, if well packed, at a cost to us of five cents each, which can be examined at any time without disturbing the fruit. Its condition and value can be ascertained

by seller and buyer without breaking bulk. In this, should the fruit be put from the trees, carefully assorted, and it will sell for enough more than to pay the cost of package over any ordinary bag or barrel, for the near market, of course; and for home use it will be found economical for potatoes as well as apples. It will be seen that for convenience of hauling and packing they are just the thing. Then, again, how much of our fall fruit is left to over-ripen and decay for want of the prudent forethought and family industry of the farmers of the east, who save, by drying, the millions of bushels of apples which find so ready a market in all the west.

All the operations of conserving fruit should be planned and provided for early. Early thinning of the early summer fruits is often very economical. Hand pick the first fine colored specimens and commence selling early, and you will gain both time and money by it. Most of our grapes can be readily kept fresh for winter use, provided they are carefully handled and packed away in shallow boxes and kept in a dry, cool room. We have practiced putting them down in stone jars, salting with sugar at the rate of three pounds of sugar to ten pounds of fruit; put a light weight on the top and they will form their own pickle, and will be most toothsome for a winter diet. The usual canning processes cannot be too highly commended. We have put down many bushels of raspberries and of Siberians and other apples in stone churns, first cooking as for the glass jar, and then sealing with a close fitting plate and wax around the rim. These summer fruits put up with or without sugar can be seasoned to suit the taste, and even the very acids are very acceptable toward the advent of spring. For the health and enjoyments of our families as well as for economy, should we study to conserve our home grown fruits.

The next paper presented was by Mrs. Mary D. Arnold, of Galesville, on

FLOWERS.

God's good will to His creatures is shown in nothing more evidently, than in the mute language of the endless profusion of bloom, ever renewing and filling every corner of the earth. As we look into and study these tokens, the sight and the thoughts expand; we see beauties that we passed unconscious of before, and we become witnesses of better things, and have invitations to better thoughts than the coarser dross of earth engenders.

The early spring flowers bring with them both sorrowful and sweet remembrances. They are fraught with the recollections of a sunny childhood, and a joyous youth, past and gone. Time leaves no imprint upon their fair bloom, but it writes its hours with an enduring chisel upon our brows. But we will not brood gloomily over the inevitable. We will welcome with gladness the little snowdrop, with its single and double flowers, ere the snow has melted from our northern hillsides. The *eranthis hyemalis*, with its yellow blossoms scarcely behind the snowdrop in time; Siberian squill, with its deep blue flower; the purple and white crocuses, and the various shades of yellow, open their cups to the clear blue sky. The different varieties of the English cowslip, the iris, sweet violet, pansy, and the earlier varieties of the narcissus, along with our old time friend, the daffodil, all of these, and many of our wild flowers, we enjoy before we fairly realize that winter has left us. Ere many days, our first trees are in bloom, and the air is fragrant with perfume. Never did the apple tree blossom more gloriously than this season. Clad in their clusters of pink and white blossoms, they were beautiful. The language of the apple blossom is Preference, and surely every lover of flowers must have a preference for this dainty blossom. There is indeed a daintiness about these pretty flowers. We view them with a double pleasure, thinking of the rich autumn harvest they promise. The frost king visited us when we did not wish to see him. We have had the delightful bloom, but will not have the delicious fruit.

Lilacs, Tartarian honeysuckles, tree peonies, flowering almond, snowball, rose acacia, massive beds of tulips, and lovely lilies, are

now most welcome. June is, *par excellence*, the month of roses, noblest "Queen of Flowers." She chooses the most delightful month of all the year, when it is perfect summer everywhere; before the sun scorches the green grass and steals the freshness from bough and leaf; when everything rejoices in the pure air, the fleecy clouds and the gorgeously tinted sunsets. The praises of the rose are sung by the poets of every clime. Our florists cultivate acres of them, raise millions of plants for sale; still, it is not held in higher esteem than years ago by the ancients. At their festivals roses were woven in festoons, suspended from the ceiling, wreathed over the arches, and the horses that drew their chariots were adorned with them. Everywhere they were used as an ornament. There are upwards of ten thousand varieties now grown and we can readily comprehend the perfection to which rose culture has attained. It will hardly do to particularize in this short paper, and my conscience would upbraid me for mentioning only the few, when they are all so lovely.

If we have not been forgetful of the seed time, we will ere many weeks be delighted with daises white, azaleas bright, scarlet salvias, the foxglove's purple bells, and larkspur with eyes of blue, bright hued flowers of drummond phlox, balsams and asters in great variety. The convolvulus will peep in at our windows, bidding us a cheerful good morning. I have thought so many times that I would like to visit some of the extensive flower farms of James Vick, Bliss, Henderson, Allen, or some others of our noted florists. Just imagine, ye lovers of flowers, who take such pride in a few dozen plants, acres of pink, purple, crimson, scarlet, white and variegated blossoms; lilies of all kinds and descriptions; acres of carnations and roses, mingling their fragrance with sweet verbena and heliotrope. The green-houses connected with these grounds, how perfectly gorgeous they must be! The pictures of our imagination that we may form of them, cannot possibly exceed their loveliness.

I was reading a few days ago a description of Mr. Shaw's gardens at St. Louis. What a nice old bachelor he must be. This whim of his is truly remarkable, and he will be praised and honored for it. What a beautiful gift to the great city. He must be a man of the best of taste, one of the real lovers of the beautiful in nature, the beautiful God-given flowers. Woodward's gardens of

California are similar. No policemen or guards are on the watch. Flowers could readily be stolen, and a great deal of careless or malicious mischief perpetrated, but nothing is ever harmed. The restraint that prevails furnishes indisputable testimony to the miraculous educational and refining power of such delightful resorts, where the rich and the poor alike may enjoy them.

"'Tis the flowers
We seek, and ever find. 'Tis well, 'tis well
That nature plants them thick above our path;
And varied — varied for our varying moods."

"They grow where e'er kind nature planted them —
Some in wide vacant places; some twixt roots
Of trees; some in clefts of rocks, and some
A merry company upon a rock."

No house looks home-like in these days without flowers about it some where, in door or out, and their cultivation is becoming more and more popular. It is a healthy occupation and amusement. It offers to all exercise in the open air, and in return for it will give the workers beauty in form and coloring. It offers to us the most unalloyed pleasures. Every day it creates a new interest, for fresh leaves and flowers are developed and open their chalices freighted with the richest perfume. The same sunshine is equally essential to our health, that is necessary to plant growth. In too many houses its life-giving rays are excluded. It fades the glowing colors of the carpets, the gay upholstering of furniture and curtains, so it can not enter our domiciles. We should learn a lesson from the plants we cultivate, consider their ways and mend our own.

The presence of flowers refines, beautifies and sweetens. We plead for the beautiful in farm life. "We should do our utmost to encourage the beautiful, for the useful encourages itself." That existence is surely contemptible which regards only the gratification of instinctive wants, and the preservation of a body made to perish. We should go higher than Bunyan's man, who was figuratively represented with his nose nearly touching the ground, which he vigorously dug with his muck rake. I do not know as I would say that a taste for flowers will wholly change a man's nature; yet I'm

quite sure that if rightfully directed it will prove a great and useful auxiliary. Man gazes on the beautiful, and whether it be the earth putting on her mantle of green, the bud bursting into life, or the flowers of a thousand hues, his tenderest feelings are touched under such an influence. His nature, hardened by care, begins to relax. It is this wonderful power which the system has of rapidly resting while the mind is entirely diverted by some intense and refreshing pleasure, which makes the cultivation of flowers so pleasurable. Upon children, flowers have an important moral influence. It is often touching to see how a little blossom is cherished by the rough, stout boy, who might seem to have no love for the beautiful in his nature.

The use of flowers at fashionable parties and weddings has increased wonderfully within the last few years. It is not unusual for from $500 to $1,000 to be expended for flowers and plants for a single occasion. Over one million dollars' worth of flowers are sold in New York city annually. Nearly one fourth, or $250,000 worth, are purchased during the Christmas and New Year holidays. A writer from England says: "That more than half of the first floor windows in London have flowers or plants before or behind the glass. In some streets every window has its tray on the sill. Gilliflowers or stocks are grown in the greatest perfection among the peasantry of England." The weavers of Paisley are everywhere celebrated for their beautiful pinks. In Germany and France the love of flowers is a national trait, and almost every garden among us is brightened by some gorgeous souvenir of Holland. The people of Japan are flower worshipers.

The flowers are generous; their fragrance is not pent up in themselves, but is wafted in every tiny current of air, and is shared by every one who passes by our grounds or enters our parlors, and we doubt not but many wistful eyes admire the bright colorings and desire to hold some of them in their hands as their *very* own. Feeling this is what suggested, I imagine, the Flower Mission of New York city, with which, I presume, many of you are familiar. There is great waste of flowers in the gardens of the wealthy; myriads of fair, sweet blossoms drooped and faded through long summer days, sometimes because the owners were absent, oftener still because of the superabundance resulting from liberal culture.

To get some of these, and wild ones from the woods, and then distribute them among the sick and poor of the city, is the object of this mission. We quote a few words from an account of the first day's experiment:

"The first to come were two bright-eyed girls, who, glowing with the air of their country homes, and excitement from the thought of the pleasure they had the means of giving, appeared with baskets filled with houstonias, cowslips, violets and anemones nicely tied up in pretty bunches; then came two more with baskets full of English violets, and again another with wild flowers. So far all were personal friends. The next contribution, however, was from a stranger, lovely hot-house flowers; again, a silver wedding gift of twelve beautiful bouquets, seeming to the donors the pleasantest memorial they could have of their own happiness. Again, a Lady Bountiful sends her carriage laden with cut flowers, pot-plants and flowering shrubs."

In the year 1872, 12,000 bouquets were distributed, 700 donations of fruit and 2,000 pond lilies. Now, in the summer of 1878, their work will be great, and thousands of hearts be made glad by the reception of these sweet flowers that would otherwise know nothing of them. There is a similar society in London, where the children are employed to gather hampers of wild flowers, which are afterwards sent to the hospitals. The eye of the weary and friendless patient brightens at the sight of the sweet bouquet that is brought by gentle hands to his bedside. These fragrant flowers come like a messenger of hope and comfort from the outer world. Many times they are better than pills and powders. There remains with them the sweetness of loving *deeds* — the flowers of paradise.

Flowers can never be made other than lovely, yet in arranging them in vases, we frequently see them gathered so closely together, without regard to size or color, that you feel almost as if some one had tried to make them hideous. There is "quite a knack," as the saying is, in arranging bouquets. I believe the fault usually is in having too many flowers, and not enough of their own leaves, or of some fern or delicate spray mingled in with them. We especially need the sweet scented flowers for bouquets. Sweet violet, hyacinth, heliotrope, pinks, candytuft, sweet briar, tea roses, sweet alyssum,

mignonette, carnations, sweet pea, and sweet scented, perpetual roses. These have perfumes rivaling the "odors from the spicy shades of Araby, the blest." The lady who sweeps her velvets over the mosaic walks of the conservatory, does not feel more pleasure in the possession of that costly structure, than will flush the face of the lowly woman, as she bends over her one fuchsia, growing with true democracy of flowers in all the luxuriance of its natural form, in an old, cracked sugar bowl, her hand, hard and toil-stained, toying tenderly with its graceful bells. She forgets that her whole frame aches with weariness, and her soul goes out for a brief moment in unutterable joy, leaving her body to rest — they are so gratefully soothing.

We lay them, as a nation, on the graves of our soldiers in token of a patriotic sentiment, which tends to inspire loyalty in the hearts of all who witness the ceremony. We scatter them with tender love and regret around the dear one taken from our circle. We deck the young bride with fair blossoms expressive of loving wishes. With their fragile beauty, their wondrous color, their exquisite fragrance, they possess the power to make the plainest house attractive. They are ever smiling and innocently quiet, never loudly complaining or reproachful companions; yet they speak a language silent, but expressive of inspiration, instruction and consolation.

"Beautiful flowers, wherever ye bloom,
With your soft-tinted leaves and your fragrant perfume;
Whether in Spring ye come forth from the ground,
Or when Autumn scatters her dead leaves around,
Whether in cottage or palace ye dwell,
Beautiful flowers, I love you well.

Behold a young girl in her mirthful play,
Laughing the hours of childhood away;
The light winds are waving her sunny hair,
And her voice sounds sweet in the silent air,
While her fair hands are twining from summer bowers
Wild blooming wreaths of the beautiful flowers.

The scene is now changed, for years have flown,
The gay laughing girl to a woman has grown;
And the lover is there who fain would tell

The secret their eyes have revealed too well;
But flowers he plants on her snowy breast,
And their eloquent leaves have his love confessed.

'Tis a bridal morn, and loudly swells
A merry peal from the old church bells;
The white robed bride is smiling now,
'Neath a budding wreath from the orange bough;
And bright-eyed maidens before her strew
Beautiful flowers of every hue.

There's a voice of sorrow, for time hath fled,
A wife and a mother lies cold and dead;
They've laid her to sleep in her endless rest,
With a young babe clasped to her marble breast,
Decking the bud and the blossom in death.

In the green church-yard is a lonely spot,
Where the joyous sunshine enters not;
Deep in the gloom of the cypress shade,
There is her home in the cold earth made;
And over her still the sweet flowrets bloom —
They were near her in life and forsake not her tomb.

Beautiful flowers, ye seem to be
Linked in the fond ties of memory;
Companions ye were to our childhood's day,
Companions ye are to our lifeless clay;
And barren and drear were this world of ours,
Lacking the smile of the beautiful flowers."

Mr. Plumb was much pleased to hear this pleasant subject repsented in such an appropriate manner. He hoped that we should ever have the cheering and refining influence of flowers in our homes. They do much to develop the love of the beautiful, and good taste and order, in our younger days, which follow us in after years. The order and arrangement of Senator Arnold's bureau in boyhood days had great influence in forming habits of order and fitting him for the better discharge of the duties of life. So by instilling a love, a taste for flowers in children, we can do much to cheer and help them on in life.

KEEPING GRAPES.—In reply to a request to give the method of preserving grapes alluded to in his paper more fully, Mr. Plumb said: "Select good, well ripened bunches of grapes; remove all green and unsound berries; place a layer of grapes in a stone jar, packing the bunches closely, but avoid pressing so as to bruise the fruit; then sprinkle on a layer of fine sugar; fill the jar with alternate layers of grapes and sugar, using the latter at the rate of one pound to four pounds of grapes; place a plate over the top, with a weight on it, to keep the grapes covered with the liquor formed from the melted sugar and the juice of the grapes. In this way, if put in a cool place, the grapes could be kept until January and even later, and retain their fresh taste much better than when prepared in any other way. The juice coming from the grapes had much of the vinous element in it; this might change to some extent to alcohol, but if this was regarded as objectionable, it could be avoided by putting more sugar with the grapes. He had also heard of keeping grapes in the fresh state without sugar, by packing them in jars and burying them in the ground, where they would be dry and keep at an even and low temperature. The keeping quality of our fruit would be much improved, if more attention were paid to picking it at the proper time, storing it with more care, and providing suitable houses in which to store it. He had no doubt but that one-half of the crop of early apples in Jefferson county was wasted in 1876, by leaving it too long on the trees; it got overripe and much of it commenced to decay as soon as harvested, and the market value of the whole was depreciated. Mr. Olds, of Clinton, had built a house in which to store fruit, which he believed was working very well. He approved of Mr. Olds' plan of storing in bushel boxes. These boxes are easily handled, without injury to the fruit, and are readily examined to see how the fruit is keeping, being made of narrow strips with spaces between. It is not advisable to pick over or handle fruit much, as this hastens decay.

ROSE CULTURE. — The question, "What are the hardiest varieties of roses, and the best methods of culture," was discussed.

President Smith called on Mrs. Arnold to give us the benefit of her experience on this subject; in response to which she stated that she had but little knowledge, and had not given much attention

to roses and their cultivation. She had about fifteen varieties of the different kinds of hardy and perpetuals, but did not know their names; they did not seem to be as hardy, or thrifty, or as free bloomers as roses were years ago, but had usually done well, compared with the results of others; the culture given had been but little. She had tried to raise roses as house plants, but though the utmost pains were taken with them the result was not very satisfactory.

Mrs. Ryan inquired where we could get the old fashioned roses, that often used to bloom profusely from year to year, with little or no care at all. Now, give the best of care, and even the best and hardiest kinds bloom but sparingly and die out in a few years.

Dr. Kezerta said he was very much pleased with the Queen of the Prairie. He had cultivated very fine plants of this variety for a number of years. It was a profuse bloomer, and the roses were very full, perfect and handsome. It was not hardy, and required careful covering in winter, and with the best of care would occasionally kill out.

Mr. Tuttle said the Queen of the Prairie was truly a magnificent rose, but he regarded the Gem of the Prairie as much more desirable; it was hardier, and the flowers were fragrant. He was a great admirer of roses and thought they ought to be more generally cultivated. The hardy kinds, in soil suitable for corn, and with proper care, would do well. There are very many desirable varieties of the perpetuals, Bourbons and Tea roses; which, with proper care and protection, could be raised with good success; many of them are only half hardy, but there were a number of the perpetuals just as hardy as any of the old fashioned roses, if properly trained. The trouble with our roses now, is the same as with the Delaware grape at first; for years it was very tender and unsatisfactory, but this was the result of hot house culture; so with roses, they are propagated in hot houses, forced to the utmost possible development, and are consequently tender and short lived. When cultivated under changed conditions, greater hardiness can be secured by careful propagation and culture. Most of the new roses sent out by our special rose culturists, are lacking in vigor and strength on account of the treatment in the hot house, and are not worth one cent per hundred for common garden or house culture.

Mr. Plumb also mentioned a number of the most desirable kinds of the different varieties. He said that the public need to be informed both how to cultivate and what kinds to buy. If they have no knowledge of the different kinds, and judge of them by the fine colored plates presented by agents, they will be very likely to be disappointed; they must learn what they want, and how to treat them, and then they will succeed in raising fine roses. There are many thousand kinds now cultivated, many of them differing but slightly from each other. Foreign cultivators have, by extra care, refined our roses so as to develop very fine colors, with various tints and shades and form of flower, but at the expense of vigor. This vigor is what all our roses lack, and it is this which makes them so liable to mildew, the great trouble in rose culture of the present day. There are many of the half hardy kinds of the Bourbon and tea roses that are very desirable for cultivation in house or lawn, if carefully protected in the winter; they must be well covered or taken up and kept in the cellar. When kept in the cellar, much judgment and care is necessary to keep them at the right temperature, and to regulate the moisture so as to prevent growth and yet so as to retain their vitality unimpaired. The plants should be kept as near dormant as possible; this is sometimes difficult to do, as they are very apt to grow, and if dried down so as to prevent this, it is liable to be carried too far and weaken or kill the roots. Without this "ripening process" for winter keeping, as it is called, it is impossible to engage successfully, to any extent, in rose culture. The requisite knowledge and skill for this can readily be obtained by experience.

Mr. Kellogg said that great care should be taken in the preparation of the ground, to secure the best development of the rose. He would put on the ground designed for the bed, six inches of leaf mold from the woods, six inches of well rotted manure, well pulverized and mixed with the soil eighteen inches in depth; then, early in the spring, procure good, strong plants; set them two inches deeper than they stood in the pot or ground before; mulch freely, and prune severely, especially old bushes. If you want a heavy fall bloom from your hybrids, do not let them bloom too much in June. Select from the following good varieties the kinds and number you wish to cultivate:

CLIMBERS.— Gem and Queen of the Prairies, Baltimore Belle, Maheca or Multiflora; and to stand without protection, the Michigan; this is very hardy, a free bloomer, but it is a single rose and is not lasting or fragrant.

JUNE ROSES.— Of the June roses, which can be bought for from ten to twenty-five cents, there is the Madame Plantier, white; Harrison, yellow, and hardy; Yellow Persian, tender; George the IV, dark, velvety. I have also a choice little dwarf, hardy, free bloomer, with petals two inches in width; semi-double, but a very showy, cheap rose.

HYBRID PERPETUALS.— Of these, plant Gen. Jacqueminot, scarlet crimson, the finest rose that blooms. In contrast with this, plant La France, pale peach, and equally desirable. If I could have only three kinds, I would add La Reine, pink. If you can add three more varieties, get Fannie Petxhold, white; John Hopper, carmine, and Gen. Washington, red.

MOSS ROSES.— Of these, set Duchess de Industry, dark; Comptess Muriness, white; Princess Adelaide, blush. If you can have but one, this is the Moss rose; and last, but not least, Perpetual White Moss.

From the foregoing twenty named varieties, one can choose and not miss. These are the best, and they are good enough for any one. Yet tastes differ, and if this list does not suit you, take your pick from the thousand varieties in cultivation, but send your order direct to some responsible dealer; state the colors, size and class you prefer, and leave the selection of the varieties to him, as far as you can.

The greatest enemy of the rose is the slug. Watch for his first appearance, and dust him, while the bushes are wet with dew, with white hellebore, and follow it up until he quits. For winter protection, cover with matting and marsh hay to prevent freezing and thawing and to keep off the sun, but be sure to mound up with earth, before the ground freezes, to protect from mice. It is so difficult to dry down the plants in the cellar so as to prevent winter-growth and not injure the roots, that it is better to cover them and eave them out doors.

Mr. Phillips said he was not posted on the subject of flowers;

did not know their names, or much about their cultivation; but he was fond of them. He was especially interested in the apple blossom, more perhaps for its prospective returns than for its present beauty. At the time of the late frost, he started out early in the morning to admire them, and see how they were; he was very anxious until he found that they were unharmed, and hurried back to the house to inform his wife of their safety, without even thinking to look at the garden flowers for which she had the greatest solicitude.

Senator Arnold thought that his knowledge and appreciation of flowers was much like that of friend Phillips, yet he was very fond of them; he liked to see them in and around the house, but he thought there were no flowers, roses or plants like the old ones we used to have; none bloomed so freely, or were so handsome or so hardy. Much of their value comes from old associations, doubtless, but they were certainly more vigorous, and would do better with little or no attention than the new varieties, now cultivated, do with the best of care. There is a great variety of taste in the kinds of flowers and form of their cultivation; some fill their yards with clam shells, cobble stones, heaps of brick and stones, or piles of rubbish, and then have flowers planted among or running over these, but he liked to see flowers, both annuals and roses, standing in the grass; not growing in the grass, but in beds cut in the lawn, beds of different shapes and placed around in pleasing diversity, rather than in straight, stiff lines.

Mrs. Ryan thought it had a more pleasing effect and was better taste to have beds of flowers, both annuals and roses, set out in the lawn; the green grass was a pleasant contrast, and set out the varied colors to better advantage. She was an admirer of roses, and had given much attention to their cultivation. The soil she thought best adapted to them is loam or leaf mold, enriched with manure from the barn yard. But with the best cultivation she had not succeeded in securing as good flowers as formerly. The old varieties do not bloom as freely, the roses are not as perfect and handsome as they used to be, and the bushes die out every few years and have to be replanted. The "Cinnamon" rose is the only one of the old kinds she has left. The perpetual roses, with her, bloom three times each season; once freely, like the annual kinds, the other times sparingly.

By vote of the society, Mrs. Ryan was requested to write a paper on Roses, giving her experience in their culture, to be read at the next annual meeting of the society.

THANKS TENDERED.— The following resolutions were presented by Mr. Kellogg, and passed without dissent:

WHEREAS, The Sauk County Horticultural Society, by their generous invitation at our last annual meeting by A. G. Tuttle, did invite the State Horticultural Society to meet with them and hold their June meeting; and,

WHEREAS, The officers and executive committee of this society have taken every measure to make the June meeting a pleasurable success; have offered a special premium list; have spared no pains or labor in the arrangement of the rooms for the exhibition of plants, flowers, fruits, vegetables, etc., and providing a railroad excursion to the grounds of N. C. Kirk, and generous hospitality in entertaining delegates from abroad; therefore,

Resolved, 1st, That we tender our hearty thanks to the officers and executive committee of the Sauk County Horticultural Society and the citizens of Baraboo and vicinity, for their kind and generous hospitality;

2d, That we extend to the railroads that have granted us excursion rates our hearty thanks;

3d, That we tender our hearty thanks to N. C. Kirk, proprietor of the picnic grounds at Devil's Lake, for the free use of his grounds and pavilion for the use of the convention;

4th, That we concur in the vote of thanks tendered to the ladies who have furnished us with papers for this occasion, and request that a copy be given our secretary for the coming transactions.

G. J. KELLOGG,
J. C. PLUMB,
A. J. PHILLIPS,
Committee.

Society adjourned.

MEETING FOR DISCUSSION AT THE FAIR.

It was thought advisable, by a number of members of the society who were in attendance at the State Fair, to resume the custom of holding a meeting for discussion some evening during the week of the fair; therefore notice was given that such a meeting would be held on Wednesday evening, Sept. 5th, at the Agricultural Rooms in the Capitol, and that the subjects for consideration would be "The Exhibition of Fruit at the Fair of 1878," and "Climatic and other causes affecting the fruit crop of the present season."

On calling the society to order, President Smith, in introducing the first subject for discussion, said that he was much pleased to see so creditable a display of fruit on exhibition, and thought that it gave us good ground for encouragement in regard to the fruit growing interest of the state. He was specially gratified to see the northern portion of the state so well represented by its fruits. He had come, year after year, to the meetings of the society, and spoken of the success of particular orchards in Brown county, the pear orchard near Green Bay especially; and the accounts he had given had been so very favorable, even in seasons when there was little or no fruit in large portions of the state, that he had often been disposed not to mention it again, lest the members of the society should think that his statements were greatly exaggerated, and he was very glad to be able to show samples of fruits from the orchard, and to bring forward the testimony of a number of persons present, who were well acquainted with it, to confirm the statements he had made.

Mr. W. Reynolds, secretary of the Brown County Horticultural Society, being called on, said that he had known the pear orchard mentioned for a number of years. It stands near the top and on the eastern slope of quite a high ridge lying between Green Bay and Lake Michigan. The soil is quite poor. Great pains was taken in setting out the trees, and for a number of years they were well cultivated, but lately they have been neglected. They now stand in sod ground. The present proprietor does nothing for them beyond the marketing of the fruit. There are about forty trees in all. Some four or five of them seem to be affected with

blight or some other disease; but the balance are sound and healthy trees, are nearly all of them literally loaded with fruit the present season. The lower limbs had to be supported to prevent their breaking down with the weight of pears; the limbs were all so much bent with their load of fruit that it was difficult to get around under the trees. At President Smith's request, he had brought some of the pears and put on exhibition. One branch of the White Doyenne, about twelve inches long, had forty pears on it, and this was not an exceptional cluster; there were many others like it. He had never seen a crop like it elsewhere. The orchard had paid for itself many times over, bearing more or less every year, and frequently, very heavy crops. The different varieties all seemed about equally thrifty and productive. The trees were low, branching out near the ground; the largest of them were about eight inches in diameter.

President Smith thought that with these facts before us it was wrong to say that we cannot raise pears in Wisconsin. He was confident that great advances would be made in pear culture; hardier varieties will be found, and we shall learn better how to cultivate them. By observing closely the facts in connection with the soil, location, and cultivation of this and other successful orchards, we shall find many locations where the same conditions can be had, and like culture will bring like results. A pear orchard of five acres like this would be a fortune to any man. This orchard has paid for itself many times over. The trees were set out in 1862, and, commencing to bear in 1865 and 1866, had borne every year since.

Mr. Bennett, of Brown county, was acquainted with Mr. Decker, who set out the orchard. Great care was taken in the preparation of the ground and the setting of trees, and afterwards their cultivation was such, while Mr. Decker retained possession, as to promote a strong and thrifty growth. The soil was poor in quality, being mainly composed of a yellowish sand, the color seeming to indicate the presence of iron. About a foot from the surface, a clay subsoil was found. The surface soil was thrown off, the subsoil trenched, and the hillside formed into terraces, about five feet high and the same wide. The sandy soil was then thrown back on the surface of the terrace and lightly manured, and a row of trees set on each terrace. They made a remarkably healthy and thrifty

but not a large growth, and came early to bearing, and, as others have said, have been remarkable for their regular and abundant yield. He thought this lay in the proper care given to the young trees; in the adaptation of the soil and location to the production of a slow but healthy growth. The pear needs a stiff, heavy, but not a rich soil, and it is very essential that it should be well underdrained.

Mr. J. C. Plumb, of Milton, remarked that such wonderful accounts had been given of that pear orchard as to create a great desire on his part to visit it. He had seen it a number of times, and could say that the reports given of its fruitfulness and thrift have not been exaggerated. The land was quite broken in its character; the soil was very poor; was not of sufficient strength to raise cabbages. The surface soil was quite sandy but contained considerable limestone in its formation; this rested on a subsoil of shale, or what is usually called a clay subsoil. The location was high and exposed, the highest of any point in that section, and there was no shelter in any direction; but here the trees stood, in a blue grass sod, yet hardy, thrifty and loaded with fruit. He was satisfied that what had been done there could be done in 10,000 places in Wisconsin. By the proper choice of soil and location, and the right care, we can raise pears. He had no doubt but that much of the broken land in Brown and Door counties, now regarded of but little value, were well adapted to the growth of fruit. The fruit on exhibition at the fair, from the northern part of the state, was superior in fairness, in color and in quality to that from the southern and middle portions. The difference seems to be greater this season than usual, but this fact can be observed nearly every season, and seems to indicate that the further north fruit can be grown the better the quality. He believed that in the northern portions of the state, fruit will yet be successfully raised in many locations which are now regarded as beyond the fruit bearing belt.

Mr. Bennett said that many of the attempts in that section to establish apple orchards had not been successful; many of the trees had been killed or seriously injured. Some varieties seem to endure better than others. The apples brought from that section for exhibition were mostly from an orchard owned by Mr. Cotton, who had been as successful as anyone. His orchard stands in a hard, white clay soil, commonly known as a white oak soil. Nearly

two-thirds of the trees originally set out died, but there is one row of nine Fameuse trees that has escaped injury. These nine trees have borne heavy crops of fruit every other year since they came into bearing, and some every year.

Mr. J. S. Stickney, of Wauwatosa, said it was encouraging to learn of some instances of success in raising pears, and that the varieties doing the best in the pear orchard at Green Bay were those commonly set and regarded as the best adapted to cultivation here. He raised some pears; had picked Flemish Beauty pears that he had no doubt had cost him five dollars a piece, yet he sets out a few trees every year. Pear trees need a soil rich in mineral elements, but not a rich soil; should not be cultivated but rather be kept back, so as to make a slow and steady growth. With such treatment and in such soil, he had no doubt that in many places pears might be raised successfully. The disposition to blight was a serious drawback, and the tendency to this is as great on the lake shore as in other portions of the state.

Mr. Kellogg, of Janesville, in reply to an inquiry, said he would not withdraw his statement in relation to the average cost of pears raised in this state, but might in time have to except the lake shore region. Nearly all the pears on exhibition, year after year, at our fairs, and all the instances of successful culture, are confined to this belt. Ozanne, at Racine, Smith, Parks, Jeffrey, Pilgrim, and this orchard at Green Bay, are all in this region. There was one tree in Rock county that had been a success, and he believed only one.

Mr. Jeffrey, of Smithville, said he was located in what was called the lake shore belt, and had met with some success in raising pears. Had lost many trees by blight, but still thought it paid. He had set out fifty pear trees this season and should keep on setting.

CAUSES AFFECTING FRUIT CROP.— Mr. Stickney introduced this subject by stating that we never started out in a season with a fairer prospect of a bountiful yield of all kinds of fruit than this spring, but heavy frosts in May, at the time the fruit buds were opening, seriously marred the prospect; and those frosts were followed by a long spell of cold, chilly weather, which seemed to check the development of the foliage; there was some time that the growth of leaf and tree seemed to be entirely suspended, and it seemed a question whether the leaves that had formed would start

anew or go back. This check of the foliage affected the whole season, both in fruit and wood growth. In some varieties there was not sufficient power to develop the little fruit that had escaped the frost, and it blasted; and in those varieties that bore sparingly even, as the Duchess, Keswick's Codling and Golden Russet, the fruit was imperfect in form and inferior in quality, because there was not vitality enough to develop it. The foliage of some of the hardiest varieties was affected the most; as the Transcendent, Fall Orange and Plumb's Cider. The Tetofsky was not affected in this way, but bore no fruit. Later in the season, a severe drought all along the lake shore seriously affected the development of tree and fruit.

Mr. Geo. P. Peffer, of Pewaukee, had experienced the same trouble as Mr. Stickney. Even the foliage of the plum tree, tame and wild, was injured, not apparently by the frost, but by the cold weather following. The leaves curled up, withered and dried up, and the fruit, where there was any, fell off. His Flemish Beauties cracked on the northwest side of the tree, the fruit was bitter, and the foliage poorly developed. With him, the trees on the southeastern slope suffered the most, or more than on the southern.

Mr. Phillips, of West Salem, had in a measure escaped the injuries suffered by most of the fruit growers in the southwestern part of the state. He thought he had about two-thirds of the apples raised in La Crosse county. His trees were mostly young; had been set three or four years, and they had as much fruit as they ought to carry. There are no apples on the low lands or in the valleys, and generally but a light crop on the ridges. Mr. Wilcox had also informed him that it was the same in the country west — no fruit on the prairie, all on the high land.

Mr. Plumb thought that many causes tended to injure the fruit crop of the season. It was not all the frosts of May, or the subsequent chilly weather. Our trees had been weakened by the heavy fruitage of the previous year, and had not yet recovered their vitality; insects, too, had done much injury. The canker worm and leaf roller had caused much damage in many parts of the state. Various causes operate together, and each intensifies the effect of the others. It is specially noteworthy that high locations have suffered the least, and in some instances seem to have escaped injury entirely.

Mr. Kellogg remarked that in his experience and observations

the Russets seem to have done much the best, and in many instances bore a full crop, perfect in form and quality, while other kinds, the Willow Twig, especially, were very imperfect, one sided, and gnarly. Deficient development of fruit was doubtless the direct result of deficient foliage.

RULES RELATING TO EXHIBITION.— Considerable discussion was had in relation to a growing laxity in enforcing the rules governing exhibitions at the State Fair, and the consequent evils springing from this source, which resulted in the passage of the following resolutions :

Resolved, That all competition for premiums which may be offered hereafter by this society, shall be upon the express condition that all fruits and flowers so exhibited shall be *actually grown by the exhibitor.*

Resolved, That hereafter we will strictly enforce the rule excluding from competition all fruits and flowers arriving on the grounds after the time specified in our premium list.

On motion of Mr. Stickney, the President, Secretary and Senator Anderson were appointed a committee to secure an enlargement of, and an increase in the number of copies of our transactions, and such other legislation as may be needed.

Society adjourned *sine die.*

TRANSACTIONS AT ANNUAL MEETING.

Agricultural Rooms,

Madison, *February* 3, 1879, 7½ P. M.

In accordance with Article V of the constitution of the society, which provides that the opening session of the annual meeting "shall be held on the Monday next preceding the first Tuesday of February in each year," and the notice issued by the president and secretary in pursuance therewith, the society convened at seven and one-half o'clock P. M., in the Agricultural Rooms at Madison.

The president, in calling the society to order, stated that as so much of the time allotted for our annual meeting was taken up in joint convention with the Agricultural Society, it was important we should improve the time devoted to special meetings of the society in the transaction of business. As a member of the committee appointed at the time of the fair to take into consideration the question of asking further aid from the state, he would say that the committee had not had any opportunity for combined action, and had no definite report to make. He thought, however, that it was advisable to ask for an increase in the size of our report, and of the number of copies printed, and an annual appropriation of one thousand dollars. The usefulness of the society was now crippled for the want of means, and the work done was too heavy a tax to be borne wholly by individuals. He was in favor of asking for state aid at the present time, but had thought it would be advisable to reorganize the society, if this was done, so as to assume closer relations to the state, reporting direct to the governor, and by accounting to him, show just what was done with the means placed at our disposal. He had not formed any definite plan in which this could be done, but had received a communication from the secretary which embodied, in the main, his views, and which he would like to have read so as to bring the subject before the society.

In response to the call for the reading of the communication, the secretary remarked, that, as a member of the committee on this subject, he had felt that it was best to make application for aid from the state. The society had never received a dollar from the public treasury; never had asked for one. All the aid it had ever received was the publication of its report by the state. Members of the legislature had often spoken with approval of the work of the society, and had expressed a willingness to do what they could to secure anything we needed for the carrying on of our work. There were certain reasons that made the present time rather unfavorable for the application, but he thought that if it were presented in the proper form, it would be granted. Thinking that if we received an appropriation from the state, we ought to report direct to the governor, showing the work done, and for what the money received was used, he had hurriedly drawn up a plan for the reorganization of the society with this end in view, and to increase the chances of obtaining the desired aid. This he had sent to some of the leading members of the society for their consideration, not as a definite plan, but as a basis for movement in this direction.

The plan was then read (as it is given almost in an identical form where it was brought up for final action, it is omitted here). The subject gave rise to considerable discussion, which indicated a general opinion that it was best to make the application for aid, and that it was advisable, as calculated to promote the success of the application, to reorganize the society in the manner proposed; and on motion, the subject was referred to a committee consisting of F. W. Case, J. C. Plumb, and J. S. Stickney.

Mr. Plumb offered an amendment to the constitution and by-laws of the society.

The amendment embraced many changes from the present form. The constitution and by-laws were read at length, giving the proposed changes (amendment given in connection with the report of the committee), which after some debate was referred to a committee consisting of Mr. J. C. Plumb, T. D. Pilgrim and Geo. P. Peffer, with instructions to report subsequent to report of committee on reorganization.

The president extended a very cordial invitation to the society to hold its summer meeting at Green Bay, in connection with and as the guests of the Brown County Horticultural Society.

On motion of Mr. Kellogg, this invitation was accepted, the date of the meeting being left to be decided by the local society.

On motion, the regular committees were appointed as follows:

On Arrangement of Order of Business — George J. Kellogg, A. G. Tuttle and A. J. Phillips.

On Revision of Premium List — J. S. Stickney, Geo. J. Kellogg and J. C. Plumb.

On Conference with the State Agricultural Society — J. S. Stickney.

On Fruit on Exhibition — J. C. Plumb, Geo. P. Peffer and C. H. Greenman.

On Legislation — J. M. Smith, J. S. Stickney and J. C. Plumb.

President Smith stated that he had received a communication from Mr. Hiram Smith, one of the Board of Regents of the University, conveying the information that the regents were contemplating the organization of a system of agricultural and horticultural lectures, to be given by different lecturers, at various location, and at the expense and under the control of the agricultural department of the University, and requesting the co-operation of the Horticultural Society to further this object.

This was heartily indorsed by all present, and in accordance therewith, C. H. Greenman and W. Reynolds were appointed a committee to confer with the regents on the subject.

The committee on order of business reported as follows:

February 4, 10:00 A. M., President's Address.
10:30 A. M., Secretary's report.
10:45 Revision of fruit lists and report of committees.
2:00 P. M., Treasurer's report, report of superintendent and committees of observation.
3:00 P. M., Election of officers.
4:00 P. M., Reports and discussions.

Which was accepted and adopted, and the society adjourned.

FEBRUARY 4, 10:00 A. M.

After calling the society to order, the president delivered his annual address, as follows:

OPENING ADDRESS.

Ladies and Gentlemen of the State Horticultural Society: — Since our last annual meeting, another year has fled; and its deeds, whether for good or ill, have passed into history. Again we meet together, and it is well that we do so; as these yearly meetings come none too often, let us make the most of them. Let us forget for the time being that it is, and for a number of years past has been, hard times; that with those engaged in the nursery business, it has in many cases been peculiarly trying. I need not recount the causes of these embarrassments; they are well known to you all. If we look at the past, as we may and should, the lessons of the last five years will do much toward guiding us correctly in the future. But, while we can learn from the past, let us not at this time brood or repine over the misfortunes that have in some cases caused the furrows upon our brows to deepen, and the hair of our heads to whiten faster than was its wont. Let us rather remember the many blessings and happy days that have been ours; let us look forward to the brighter days that we believe are in the near future; let us counsel together how we may make them the most valuable, not only to ourselves, but to others all about us.

As regards the portion of the state that I, in part, represent, there is no doubt but there is a decided change for the better in regard to fruit culture in its various branches. The strawberry crop of last season was a very large one, and has probably never been equaled in that portion of the state. Raspberries and blackberries grow wild in such immense quantities, that it is about useless to attempt their cultivation for the market. The grape crop was injured by the late frost of last spring, and was only a moderate one. The cultivation of this fruit is yet in its infancy in that portion of the state, the supply not being equal to one-tenth of the demand. Enough has been done to demonstrate the fact that many of our

finest varieties are perfectly at home in the Fox River Valley; and I hope the day is not far distant when the home supply will, at least, be equal to the demand. To accomplish this, we need some practical and experienced growers among us, who are able to give the business their special attention. How much further north than Green Bay grape culture will be profitable, remains to be seen. Last fall, while spending some time with a friend in Oconto, he asked me to look at his grapes; I found among them the largest and finest looking Deleware vine that I have ever seen; I doubt if it can be equaled in the state. It was well laden with fruit that bid fair to come to maturity. I merely mention this as one of the many evidences that the northeastern portion of the state is not out of the grape growing district.

But it is in apple culture that the greatest improvement is being made. In this connection, I wish to make a few suggestions to the members of this society, that seem to me to be worth your consideration. I make them with the greater freedom, because as you know, I am not personally interested in the business, never have been and never expect to be. Many years since, that portion of the state was completely and repeatedly overrun with tree peddlers. To say that they were utterly unreliable, is to speak very mildly of them; in fact, some of them, by their exceedingly dishonest transactions, would almost convince one of the doctrine of literal and total depravity. Trees were sold by car loads, and at good prices. It is safe to say that many of them never put forth either bud or leaf, and that they were the most profitable ones to the purchaser. Many others lived for a year or two, and then died. I think not one in a hundred of them ever bore a peck of fruit, and not one in a thousand of them is alive to-day. Some few, who had purchased with more care, and had succeeding in getting some of our more hardy varieties, and had cared for them somewhat better, had better success, until the terrible winters of 1871 and '72, when they lost many of their trees outright; and others seemed to be so irreparably damaged that any further usefulness from them appeared to be about hopeless. In this condition of affairs, it is not to be wondered at, if, for some years, tree peddlers and nurserymen in general were at a large discount.

The recovery of the damaged trees, those of our own hardy varieties in particular, has been surprising. One gentleman, who,

by the way, was the pioneer of apple growing in Brown county, and set an orchard of about four hundred trees over thirty years since, had in it seven trees in one row of the Fameuse. In the spring of '72 he came to me with a sad story; he was utterly disheartened and discouraged. He said that his last hope of success in apples was gone; his Fameuse had always stood heat and cold, drouth and flood with apparent indifference, and had never failed to give him their annual crop of nice fruit; but now they were gone, and he should try no more. I confess I was very much discouraged, knowing as I did, how he had tried to care for his orchard for so many years, and then to lose the last of them in that way was indeed a sorry outlook for the future. But late in the spring they began to put out buds and leaves, and the next fall they actually gave him a part of a crop of fruit. Since that time they have borne regularly, and last fall they were so thoroughly loaded that the fruit was not as large as it otherwise would have been. Many of his other trees also recovered and are doing well; but if he had set his entire orchard of four hundred trees with Fameuse, and not one tree of any other variety, I have no doubt but that they would have made him a rich man before his death. Hundreds of other trees, that for a year or two seemed to be ruined, have entirely recovered and are doing well. Last season, almost every apple tree in that portion of the state was loaded with fruit. Farmers are inquiring about fruit trees, and if they can purchase of some one in whom they can have confidence, I firmly believe that a great many may be sold within the next five years.

One of the members of our society has for years been making personal observations as to the soil, forests, growing fruit trees, etc., and last winter had at least a portion of that district canvassed, and last spring sent an excellent assortment of very fine stock for delivery. I have interested myself somewhat to learn how they have stood the summer, and how many died without ever putting out leaves; reports from them thus far have been favorable, without a single exception. If this gentleman continues in this cause, as I trust he will, it will doubtless result in a fine pecuniary benefit to himself, and great good to that district of our state. Now, the main thought that I would suggest for your consideration is this: why could not our nurserymen combine together, district the state, and learn by actual observation, each one in his own dis-

trict, what trees and fruits it is best adapted to; and then each one have his district thoroughly canvassed by fair and upright men, being very careful to recommend nothing that is not reasonably certain to do well in the district to which it is assigned. I would not prohibit men from selling outside of their districts, but simply for each one to confine himself to his district in canvassing. I know very well that in reply to all I have said, it may be and often is argued that men should only buy of good and reliable parties. They have no business to purchase of an irresponsible and unknown tree peddler, whose colored plates of fruit, and marvelous stories of their quality and value, are almost entirely imaginary; while the trees he delivers are the refuse of some nursery, that can be obtained at a nominal price, and which the real owner, who values his reputation, would not send out in his own name at any price. All this seems reasonable and sensible, and it seems as if men would either go or send direct to the nurseries of good men for their stock. Yet the stubborn fact remains, that a very large proportion of trees are sold by the mere tree peddlers. Shall this state of things continue? Not long since, I heard what was to me an exceedingly interesting discourse from the pulpit, upon the subject of overcoming evil with good. The speaker contended that it was not sufficient to denounce evil, or even to break it up; but it must be replaced by its opposite — with something good. I have thought of it repeatedly in this connection. We all agree that the manner in which our citizens have been supplied with fruit trees, and vines and shrubs, has been a great source of evil and loss, continually. We all agree in denouncing it. Can we not break up the system by putting something good in its place?

I am not positive that the above plan would be the best one that could be devised; but it seems to me that the citizens of our state should be supplied with home grown stock, as far as is possible. We believe that the most of the hard times are over, and that an era of prosperity is in the near future. It is certainly desirable that our members should reap the advantages to which, in their line, they are fairly entitled; but to do this, they cannot sit still and wait for success to come to them. The inveterate and persistent tree peddler can only be driven out and kept out, by a combined and continued effort, and by convincing the people that you can and

will sell them stock much better and more reliable than they can obtain in any other way.

I wish something more practical could be done in the way of pear culture in this state. I cannot possibly bring myself to believe that the little orchard near Green Bay is the only one, and that, the only spot where they can be made to grow. Remarkable as has been its history, and fine as its crops have been, they were all dwarfed by its wonderful show of fruit last fall. During the summer, one of my sons said to me, "Father, have you been up to Martin's pear orchard lately?" I replied, "No." "Well," said he, "you had better not go at all this season; for if you do, you will tell such extravagant stories about the crop that you will lose your entire reputation for truth and veracity all over the state. It would be useless to tell any one the truth about them, unless they could see for themselves; for they neither could nor would believe it." I visited it a number of times during the latter part of the summer and fall in company with friends; and among them was one gentleman who had traveled, not only all through our own country, but through Europe. But one exclamation came from everyone, without a single exception, that they never saw anything like it, either at home or abroad. The owner sold them for three dollars per bushel. He could not tell me how many bushels he had nor how much the crop brought him; but, from what I know of the yield of those trees for the last ten years, I do not believe that there is another piece of land of the same size in this state, in any kind of crop, that has yielded one-half the net profit of that little orchard. Probably there will be little or no fruit upon them next season; and it will be surprising, if some of them are not dead, next spring, from the exhaustion produced in maturing their last crop. But if every one of them should die this winter, they have paid for themselves and the land they stand upon, ten times over, as I verily believe. I have sometimes thought that I would never say anything more about them; but their steady, annual crop of splendid fruit has compelled me to do so, hoping that the lesson they teach would in time induce our fruit growers to give more attention to the soil and locations suitable for growing this delicious fruit.

But I wish to call you attention, for a few minutes, to another subject. Last summer, at our convention, a committee consisting

of Messrs. Case, Anderson and myself were appointed with instructions to consider whether it would not be better to ask of our legislature some action in regard to placing our society upon a somewhat different basis, and to report at this convention. We have had little opportunity for a full consultation upon the subject, and are unable to make a thorough report. Personally, I have given the subject some attention, and am inclined to say, in a few words, what seems to me to be at present advisable. I have examined the reports of some of our neighboring states, and find that their horticultural societies are much more generously cared for than ours. For instance, the Michigan society receives $2,500 per year; Illinois, $2,000; Iowa, $1,000. In addition to this, their volumes are nearly twice as large as ours. I do not believe that it can be truly said that our state is unable or unwilling to do as well by the Horticultural Society of this state as Iowa does by hers. After some consideration, it seems to me that it would be well for us to ask of our legislature to give us substantially what the Iowa legislature has given that society, viz., an appropriation directly to our society of one thousand dollars, and an enlargement of our volume to four hundred pages, provided we should need it; then our society to report directly to the governor. This would place us in an independent position, and, as I believe, would enable us to largely extend our usefulness beyond what we can do at present. It would not be necessary, nor do I think it desirable, that we should in any manner dissolve our present friendly relations with the State Agricultural Society. We can work together, as we do now, jointly, where we can; separately, when it is necessary. We are very much in need of more means. There are other things where changes for the better can be made, but I will not take your time, at present.

Our last summer's convention was a decided success in every respect; and I think that none of those who attended it would be willing to have them discontinued.

Gentlemen, I have already detained you longer than I at first intended, and will bring these remarks to a close. Our work is a noble one, and one worthy of our best efforts. It is one in which, if we are to be successful, we cannot take it up to-day, and lay it aside to-morrow; but, once fairly undertaken, we must stand by it through sunshine and through storm; and, if we do our work well,

the reward will come sooner or later. We shall never become Vanderbilts, Astors, or Stewarts; our homes even may be very modest ones; but as we one by one shall finish our work and drop from the ranks, let it be said of each of us, that the world is a little better because of his having lived in it.

Mr. Plumb remarked that the conditions of soil were quite different in the Fox River Valley and the northeastern portion of the state from that in the central and southern part of the state. There were elements in the soil better adapted to fruit and tree growth, or they were there in greater abundance. In some parts, there were local causes which seemed to modify extremes of climate, and made it possible to raise with success kinds of fruit which are too tender for other parts of the state. The proof and the result of this is to be seen in the remarkably fine display of fruit at their fairs. The difference is perhaps more marked the present season than usual, but it is seen more or less every year. There is an intimate connection between the elements in the soil, and success in fruit raising; there is an adaptation in certain kinds of soil to the wants of particular varieties of trees, which gives them greater vitality, and consequently greater hardiness and fruitfulness.

He coincided with the president that something should be done to protect the public from the imposition of the tree peddlers, which had been much worse this year than usual. Large sales had been made in many places of stock that was utterly worthless, and at high prices. In his travels in the northern part of the state, he found that they had made a thorough canvass there, and had succeeded in selling large bills of trees, in many cases to parties who ought not to have been taken in by their plausible stories and "wonderful bargains." Many persons invested in varieties too tender to succeed in the most favorable localities we have, and that too, to set where there is no hope of success with anything less hardy than crabs. The most unheard of monstrosities are palmed off on the people in this way: "hybrid cherries, brought from the top of the Rocky Mountains, so hardy as to stand any climate;" "pie-plant crossed with the peach, with the form of growth of the pie-plant and the flavor of the peach; a valuable acquisition." Many of them were sold at $1.50 each, warranted to live or they were to be replaced at half price. He thought the society ought to take some

action on this subject, and put itself on record against this imposition. The Iowa Horticultural Society had passed resolutions on this subject, and he thought we ought to do the same, and do what we can to prevent this worse than worthless stock being sold. This is all the more necessary as some of these tree peddlers do not hesitate to use the name and reputation of our home nurserymen to help pass off their stock, representing that it is from this or that nursery, as will be most likely to effect a sale.

Mr. Phillips said it was interesting to see the skill and craft these fellows use. He had been the past season in fields where they had operated extensively, both in this state and Minnesota, and found that it was a common practice with them to learn the religion or politics of those on whom they were to call, and no matter what the church or party, when they met, they belonged to the same. Another practice was to find out what varieties had proved the best with those on whom they were to call, and they would have the same kinds, and probably from the same nursery.

Mr. Pilgrim said that they had thoroughly canvassed Milwaukee county the past season, and had sold a large quantity of stock, and at high prices. It was difficult to withstand their persistence and plausible stories. They represent "large and well known nurserymen;" can show you long lists of customers who have bought of them, whom you think ought to know what they are doing; "the nurserymen themselves recommend their stock, and would have it for sale, if they could get it, but it is new, just out; and it will be a long time before it will be in the market generally."

Mr. Stickney thought that one agent had delivered over ten thousand dollars worth of stock at Milwaukee, alone; at the time of delivery there was a great rush of teams from the country all around to get their orders; some of these trees were standing within twenty rods of his own nursery; and he had no doubt but that two hundred or more of his own customers had invested in them. People generally want to try something wonderful; they are not satisfied to take what has been already tried and is well known; they want to test for themselves in hopes to obtain remarkable results. The powers of persuasion and eloquence of these tree peddlers is very remarkable, they even overcame Mr. Pilgrim, and he did not blame him or pity him. He thought this would result in good. People would learn prudence by their experience; the trouble is, experi-

ence is a dear teacher, but some will learn no other way. There is generally a good demand for good stock, and nurserymen should not be discouraged.

Some expression of opinion on this subject should be given by the society to the public. Many will not see or heed it, but it will doubtless result in much good, and he would present the following resolutions:

"WHEREAS, We have reason to believe that the people of this state are the victims of a useless and unreasonable swindle from unprincipled and irresponsible tree agents,

"*Resolved*, That nurserymen who send out agents should in all cases expect to be strictly and fully responsible for all their representations, and to fully meet all the contracts made by such agents.

"*Resolved*, That tree planters should, as a means of self-protection, demand of all who may solicit their orders for trees, *unquestionable proof* that they are the authorized agent of some reliable nurseryman, and that such nurseryman will hold himself strictly responsible for all the representations of such agent.

"*Resolved*, That tree planters may reasonably look for all new things that are really valuable in this climate, in the leading nurseries of the country, rather than in the hands of irresponsible travelling canvassers, and that it may be taken as *prima facie* evidence of fraud when scarcity or extraordinary qualities of excellence are claimed for them, or extraordinary prices asked.

"*Resolved*, That newspapers throughout the west will protect their readers from swindlers, and advance the cause of horticulture, by publishing these resolutions."

Which was passed, and the secretary was instructed to send copies to the press throughout the state.

The secretary's report was presented and read as follows:

REPORT OF THE SECRETARY.

The year through which we have passed since our last annual meeting has brought with it the usual diversity of experience and results. To some of those engaged in horticulture, it has yielded a rich harvest of the fruits of the field, the orchard and the garden; to others, the returns have been moderate in quantity, and but second rate in quality, and with very many, some of them those who have usually been our most successful cultivators, the fruits harvested have been those of experience alone; not very palatable or satisfactory to the recipient, but which, if rightly garnered and properly utilized, will yet yield some benefit. It is the mission of this, our yearly winter gathering, to carefully survey the season's labor and its results, gathering hope and courage from its successes, gaining knowledge and experience from its failures.

The reputation of our climate for extreme variability has been fully maintained the past season. The fall of 1877 was excessively wet, and when winter set in, the ground was saturated with moisture. The entire winter was excessively mild; on one day only did the mercury fall to zero, and in one only of the winter months was the average mean temperature below the freezing point; a winter with frost and snow almost left out. Many of the days in each of the winter months were so warm and pleasant, as to excite fears that the fruit crop would be destroyed by the premature development of the buds. The spring opened early, warm and pleasant, and in due time the fruit trees, small fruits and vines were covered with bloom, and never was there greater promise of a bountiful yield of all kinds of fruit; but there came a young winter in the month of May, which seriously blighted these bright prospects. This was followed by chilling wind and rain storms, which seriously retarded the development of both foliage and fruit; the effects of which were felt in diminished vitality throughout the entire season. The summer was marked for its periods of extreme heat and its excessive rains; the average rainfall for the months of May, June, July and August was over five inches each, through-

out the greater portion of the state, but a strip from twelve to fifteen miles in width along the lake shore, the natural fruit belt of the state, was an exception to this there during these months an excessive drought prevailed.

The injury resulting from these extremes was far greater in the southern than in the central and northern portions of the state, but there were localities in all parts of the state where local influences intensified or modified the effects of these extremes, so that the same diversity as usual was seen in the quantity and quality of fruit, and sometimes in very narrow limits. As a rule, in the southern counties, on low, flat ground, and warm locations with heavy soil, there was little or no fruit; on high ground and cool locations, with well drained soil, there was a moderate crop of fruit of medium quality. In the central and some of the northern counties, with a few exceptions, the small fruit crop was very large, and the apple crop much better than the average. Reports from the extreme north give yields as better than ever known before. In a report of a local fair in Minnesota, notice was made of apples on exhibition, raised three hundred miles north of St. Paul. As we are limited for time, and these points will be fully brought out in the reports of our committee of observation, and in the personal experience of members, we will proceed to the subjects more particularly relating to the society's work.

STATE FAIR.— The exhibition of fruit and flowers in the horticultural department at the State Fair was very good. The building assigned us was well filled; we think it no exaggeration to say that it was better filled than any other building on the ground. Instead of needing the aid of other departments to make use of our space, as the officers suggested, we could have aided them materially without any detriment to ourselves. This was mainly owing to the hearty response of exhibitors to the appeals for special efforts to make the show creditable, in view of the unfavorable prospects for fruit.

SUMMER MEETING.— In the number of persons present, and in the interest taken by those attending, our June meeting was a decided success. This was largely due to the great efforts on the part of the local society and the citizens of Baraboo to contribute to the interest of the meeting, and to promote the comfort and

pleasure of the members from abroad. Were our members to attend these meetings in larger numbers, and to take part more freely in the work of conducting them, they would call out a cordial welcome and cordial co-operation on the part of the citizens where held, and these gatherings would increase in interest and in their beneficial results, from year to year. It was an especially noteworthy feature of our last meeting, that there was more of a warm, social feeling, a more marked interest in the subjects presented, than we usually have seen at our annual meetings. There are, doubtless, many things advantageous and pleasant in the plan of holding joint conventions, as we have done for three years past, but I have faith to believe that by a little effort to enlarge the range of our subjects and to increase the interest of our annual meetings, we could present attractions that would draw to us as great, if not greater advantages than we now have. At present we lack much of the unity of interest we would feel in our own organization alone, and the time is too limited to permit of the presentation of more than a few subjects, and the discussion of almost none as they ought to be discussed, and we leave with the feeling that our work has been hurried through with, and but half done.

There are a large variety of subjects embraced in the department of horticulture, and it is the duty of the society, as far as possible, to cultivate the whole field. As it is now, many things of vital importance, things that would contribute largely to the wealth of the state, and the happiness and prosperity of the people, if duly considered, are passed by with little or no notice. It would add greatly to the usefulness and interest of our meetings if we could have a greater variety of those subjects presented; perhaps not at any one meeting, but in the meetings of the year, and from year to year. This work could be done most thoroughly by the appointment of a committee, whose business it shall be to lay out the work of the year; to select the subjects for papers and for discussion at the meetings, and at the annual meeting, or soon after, to assign these subjects to one or more persons each, whose duty it shall be to see that they are properly presented at the given time. This method would lead to the presentation of a greater range of subjects and a more thorough preparation, both on the part of those who prepare papers and addresses, and those who usually join in the discussions. When it is left, as now, to the

president and secretary, the first question with them is, who can we get? then, what subject will they take? and the result is, we follow on in about the same old beaten path, year after year.

TRANSACTIONS.—In the preparation of the copy for our annual volume, it was found necessary to cut down the papers and reports and to abridge the discussion much more than was desirable. A full report of our winter meeting alone would nearly fill the space allotted us. In addition to this, we have the proceedings of our summer meeting, fully as interesting and important; the reports of our committee of observation, and of local societies, which would be greatly extended were it possible to find room for them; weather reports, illustrations and the text requisite for their explanation, and many facts, statistics, points of interest and items of personal experience, which ought to be put on record in our volume. It would also be a much more satisfactory arrangement of the matter, and add much to the value of our reports, to have the discussions follow the presentation of the subject that led to them. This it is impossible to do now, on account of the necessity for economy of space. The same reason will also explain the somewhat objectionable form in which the last volume was printed, with solid instead of leaded pages. These facts should be presented to our legislature, and an effort be made to have them remove the restriction which now cripples us.

The number of copies of our report received by the society is not as large as would be desirable. Our agricultural and horticultural societies are increasing and must be supplied with the regular number of volumes; the calls for extra copies by members of the legislature, it would not be policy to disregard, and, being published at the expense of the state, there is a general feeling on the part of the members and the public that they ought to be distributed freely. When there are so many avenues through which a gratuitous supply can be obtained, it is useless to think of making them contribute very largely to the funds of the society.

When the law authorizing us to expend not to exceed $150 a year in the illustration of our report was passed, it was unfortunately made as an amendment to the wrong section, and the revision committee, therefore, regarding it as inoperative at present, left it out of their report to the legislature, but on the presentation

of the facts and a statement of the importance of the provision to us, the legislative revision committee, without hesitation, voted to recommend it as an amendment to the revision, and it is now one of the standing provisions in relation to the publication of our volume. Its careful and judicious use will add greatly to the attractiveness and value of our reports.

Entomological Collection.— The experience of the past season has served to fully demonstrate the importance of a more thorough knowledge of our insect foes, and the means by which we can destroy them. In many portions of the state, the canker worm, the apple leaf roller and the tent caterpillar have done great injury, destroying all, or nearly all, the fruit which escaped the late frost. Wet seasons have been regarded as unfavorable for the development of insect life, but in no year have these pests been so numerous, or done so much injury, as in the past one. They seem to be increasing and extending rapidly from year to year, and what is worse, there is little or no effort made to stop them. Unless some natural agency comes to our aid, or active measures are taken for their destruction, it will not be many years before every orchard in the state will be infested with them, an evil greatly to be deplored. A subject of so great importance is surely worthy of the attention of our government. We have a commissioner, appointed by the state, to see that we are not defrauded out of the few dollars we pay for insurance; also a commissioner to prevent the railroad companies from charging us a few cents too much per hundred for the produce we ship to market; why should we not have some protection against this greater evil, which, if left unchecked, may soon leave nothing to ship, nothing to insure.

The least the state should do, if it considers its own interests as connected with the prosperity of its citizens, is to commission some fit person to study the habits of our insect friends and foes, and to give to the public all possible information in relation to them; and then it should pass laws compelling those whose orchards or fields are infested with these pests to use the proper means to prevent the spread of the evil.

In order to call the attention of this society and the public mind more forcibly to this subject, and in order that we might become

better acquainted with our foes by seeing them before us, I applied to Dr. P. H. Hoy, of Racine, a gentleman well known as an enthusiast in the study of the entomology and natural history of our state, to secure a few specimens of our most destructive enemies, to place on exhibition in these rooms. To this he very kindly consented, and said that with the exception of a very few specimens, which were the only ones of the kind he had in his collection, he would present those sent to the society. He also stated that if some place could be provided where it could be well cared for, and where the public could have the benefit of it, he would furnish a large collection of the beneficial and injurious insects of our state. I trust that our society will be able to comply with these conditions and secure this valuable collection. It would be a great benefit to the public and a credit to our society. Dr. Hoy said further, as we have no state entomologist whose duty it is to attend to the work, that, if members of our society and others would send him specimens of worms and insects, which were not generally known, and with whose history and habits it was desirable to become familiar, he would give us what light and information he could in relation to them. The thanks of the society are due the doctor for this kind offer, and we should avail ourselves of this privilege.

SOCIETY LIBRARY.— A few weeks since, a letter directed to the secretary of the State Horticultural Society was received from Miss C. Ford, of Geneva, informing me that her father, Mr. Ford, recently deceased, had bequeathed a number of books to the society; "said books to be kept in the society's rooms, for the use of members and all who wished to consult them." I replied to this letter, stating that we would endeavor to carry out the wishes of the donor. With a little effort, this might be made the nucleus of a valuable aid in our work; a horticultural library. In the present condition of our finances, we cannot spend funds to purchase books, but there are many valuable reports on horticulture and entomology that could be obtained for the transportation charges; and by judicious solicitation, editors and publishers of miscellaneous books on horticulture might be induced to favor us with their works.

FACTS AND STATISTICS.— We have found by experience that it is not safe to lay down, definitely, even general rules. Our great

variety of soils, and greater diversity of outward conditions; the great variability of our climate in general and in special localities; the versatility in the combination of extremes; and the apparently inexplicable modifying or intensifying effect of local influences on these extremes, frequently giving nearly opposite results in places not far removed, will not admit of an infallible rule, or the announcement of any definite general fact, except it be that of uncertainty. After years of instruction under that most excellent teacher, experience, we settled upon a list of "iron clads," and fondly hoped we had "something to tie to;" but we soon learned that their inherent hardiness was not perfect, but only relative, enabling them to endure a little harder pressure of adverse conditions. In some instances, facts seem to prove that varieties regarded as tender have greater power of endurance than the so-called hardy ones. This shows the necessity for caution; for a thorough study of the situation and careful statement of results lest we further mislead ourselves and others. By a careful observation of facts, and the noting of each deviation from general results, and tracing it back to the producing cause or condition, we may not establish a general rule, but may discover the conditions of soil, location and culture most favorable to success. To go safely, we must observe more, theorize less. We must work out the problem, not by multiplying rules, but by adding up conditions and results, and then prove the process by getting like results from like conditions elsewhere. To do this work more expeditiously and thoroughly, our system of observation ought to be subdivided, and the duty of reporting on special subjects in the different districts, be assigned, either by the district committee or by the society, to those persons who by natural tastes, experience and location are the best fitted for the work. As it is now, all we can expect is a general statement as to the condition of a very few of the many important things that ought to be reported upon. What we want is an accumulation of actual facts and definite results, whether favorable or adverse, with the accompanying conditions.

The old law in relation to the collection by the town assessors of certain fruit statistics, was changed last winter, in accordance with the recommendation of our society, and as a result, we have much more satisfactory returns; but the secretary of state complains that owing to the incompetency of many of the assessors, they are still

far from correct or complete. To cite a few of the most prominent statements there found: The report of the number of acres in vineyards gives 925, with a reported yield in 1877 of 455,210 pounds. The number of acres in orchards in 1878 is reported as 61,819, and the number of apple trees of bearing age is placed at 1,840,572. The yield of apples in 1877 is given as 264,238 bushels. The heaviest yield is reported from Waukesha county, 37,505 bushels; next, Milwaukee, with 26,456 bushels; Racine, 23,994 bushels; Walworth, 22,923 bushels; Washington, 18,015 bushels; Dodge, 17,980; Sheboygan, 16,811; Jefferson, 15,256; and Kenosha, Fond du Lac, Dane, Columbia, Rock, Grant and Winnebago, in the order named, from 9,000 to 6,000 each. Rock, Walworth, Grant and Waukesha counties are each reported as having over 100,000 trees of a bearing age. The number of acres devoted to the cultivation of the cranberry is given as 25,041, with a yield of 72,123 bushels in 1877. The number of acres in growing timber is returned as 11,229,194.

The statistics contained in the assessors' returns are doubtless far from correct, but they are the best we have, and we trust that they will, from year to year, become more accurate and satisfactory.

There is another important work in the interest of horticulture where great good could be done, if circumstances would permit us to enter the field; that is, to aid and encourage our local horticultural organizations, by making it the duty of our executive officers or of a committee appointed for that purpose, to attend and take part in their meetings, and also to contribute to the local press information on such subjects as may be timely and important. Great loss might be prevented at times, and much benefit conferred in this way. For example, a few simple directions at the right time would lead to the destruction of many of our insect enemies. The "cheap evergreen, right from the woods," and the new strawberry fever and many other similar epidemics would lose there virulence, if a few words of caution were given at the right time. The pursuasive eloquence of the tree peddler, who comes among us year after year, hunting gulls, each season taking a new portion of the field, selling "extra hardy pear trees, grafted on French stock," and a very promising "new variety of hardy winter apples, just brought over from Russia, the Alexander," at remarkable low prices,

would lose its fascination and power to harm, if properly set forth in the press of the locality, where he is carrying on his still hunt.

Some of our local societies are actively engaged in local work; others keep up their organization, but are losing their interest, and there are many places where with little aid societies could be formed and maintained with good results. While, as remarked before, it may be regarded as the duty of this society to do this work, it is not to be expected that our members will engage in it, certainly not to the extent it ought to be done, without remuneration. If the society had funds at its disposal, they could in no way be made more efficiently to contribute to the public good, than by using them to defray the necessary expenses of those engaged in such labor.

It is thought by some that the situation warrants the society in asking of the state the means necessary to carry on this work more efficiently and more thoroughly. Since its organization, this society has not drawn a dollar from the public treasury, except for the publication of its report. While in other states near us, the horticultural societies, with fewer difficulties to contend with and greater home resources to aid them, have asked and receive yearly appropriations, you have asked nothing; kept on doing the work, giving the necessary time and footing the bills. We can continue to do so still. By insisting on a return to the former practice in our arrangement with the Agricultural Society, that we are to receive the full amount of the money offered for premiums at the fair, the sum thus obtained, with our membership fees, will meet the expenses of carrying on our work in the usual manner; but will it be advisable to do so? Ought we to be satisfied to continue on in the same old beaten path? If not, can we expect, can we lay on individuals the burden and expense, where the labor contributes mainly to the public good rather than that of the laborer. Fortunately, and I am happy to say deservedly, our society has the good will and the confidence of the public. In years past many expressions of the duty of the state to aid us, and a willingness on their part to do what they could to help us, have been made to me by members of the legislature, and there is little doubt, that, if the times were favorable, the legislature would grant anything reasonable that we might ask for, if they were satisfied that it would be judiciously expended for the public good. It will be for you to

determine whether it is best at the present time to make any move in this direction. If so, I trust it will result in giving you the means for a more extensive and more thorough work; but if not, let us go on, making the most of the means we have. There is pleasure in the work; there is gratification in seeing that progress is being made, and there is some remuneration in the benefits we receive in our own homes and in seeing those about us enjoying the results of our labors.

FRUIT DISTRICTS. — Mr. Plumb was in favor of rearranging and further division of our fruit districts; this was an important work; in other states many valuable statistics and facts were being collected in this way. In the districts as now arranged there was great diversity of conditions, and while in certain places, often separated by but a short distance, the conditions were favorable for certain kinds of fruit, in others they are entirely wanting, and these fruits could not be raised; the best methods of cultivation also vary with these varying conditions. By a close observation, much valuable information can be obtained in relation to the adaptation of certain kinds of fruit to different varieties of soil, exposure and culture.

ENTOMOLOGY. — The subject of entomology mentioned in the report was one to which we would have to give more attention. Our insect enemies were apparently on the increase, and unless some method was used for their destruction they would soon become a much more serious drawback to fruit growing. We need a state entomologist to aid us in this work, and we should avail ourselves of the kind offer of Dr. Hoy.

Mr. Kellogg moved that the thanks of the society be given to the doctor for offering us his aid; we ought to improve the opportunity and get all the information we can on this very important subject; it will be little advantage to us to secure hardy varieties, give them proper protection and culture, and then leave the results of our labor to the destruction of insects.

The motion to present the thanks of the society to Dr. Hoy was carried.

REVISION OF FRUIT LIST. — The consideration of the fruit list

was now taken up; a motion was made that the six varieties, hardiness the only test, should remain as they now stand.

Mr. Plumb thought that the society would sooner or later have to take some action in relation to the Tetofsky. Other societies are striking it out of their list.

Motion was carried.

Mr. Plumb said we ought to have two lists for general cultivation instead of one. All the varieties might do well in some places, but they would not generally. We should divide the state, and give lists of the varieties best adapted to each of these divisions, or what would perhaps be as well, or better, give a table of specifications and instructions as to conditions of soil, location and culture best adapted to the various kinds, and qualify the recommendation as dependent on conformity to these conditions. It is always necessary to consider these points in determining the question of adaptation and hardiness; and it is time that they were given as conditions of the recommendation.

Mr. Kellogg thought we needed six lists instead of one, and we might yet need one for each locality. We are continually learning something on this subject, or rather are unlearning; we have not as many hardy varieties as we had awhile ago, and may not have as many in the future as we have now. We know more than we did ten years ago, but we do not know as much now as we thought we did then.

Mr. Phillips favored the plan of recommending fewer varieties for general cultivation, reducing it, if necessary, to one or two, as they had done in Minnesota, and adapting the recommendation of other varieties to certain conditions of soil, location and culture. We meet with evidence, continually, that even the conditions that are favorable for some of the less hardy kinds are not favorable for others, perhaps hardier ones. To cite instances in his own orchard: Willow Twig does well there, but throughout the state is generally unsatisfactory; the Pewaukee also does well, but the Walbridge does not.

It was moved to appoint a committee to prepare a list of specifications of the conditions of soil, etc., qualifying the recommendation of the varieties of apples in the list for general cultivation.

Messrs. Plumb, Kellogg and Phillips were appointed on the committee.

GRAPES. — Mr. Kellogg moved to strike the Eumelan from the list. His experience with it had not been satisfactory, and as far as he knew it was the same everywhere. He called on Mr. Tuttle for his experience with it.

Mr. Tuttle had not given much attention to grape culture. Concord did much the best with him; in fact, was the only grape that there was any profit in. He cannot raise the Delaware with success; had paid $100 for Adirondac vines, and never realized five cents from them. But his Concords stood with little care and bore well; the last season they were loaded with fruit; had more than they could mature.

Mr. Kellogg knew that the Delaware was not adapted to all soils, but we cannot spare it from the list.

Mr. Plumb would like to see the list rearranged.

Mr. Greenman thought that, as with apples, we should specify for what they were recommended, as the Concord for general cultivation, the Janesville for market purposes, and the Delaware for quality. He could make more from the Janesville than from any other; it ripened earlier, and he could bring it into market before the others were ripe, and so find ready sale at good prices. Its quality was not as good as some others.

Mr. Kellogg said that it was easy to account for its ready sale in Milwaukee; where they drink so much lager beer, and did not know what was good, they would eat the Janesville.

The subject of specifying conditions to accompany the recommendation of the grape list, was referred to the committee on the same subject for the apple list.

Mr. Plumb moved to add to the list for trial, the Lady Brighton and Champion, which was carried.

Mr. Kellogg was in favor of dropping Rogers' No. 3, Massasoit.

President Smith said it was doing well in some places, and thought it had better be retained.

Mr. Tuttle said No. 3 does well in cool localities; in such a situation, he thinks it is one of the best of the Rogers collection.

RASPBERRIES.— Mr Plumb called for information in relation to Fastolff and Brinkle's Orange.

Mr. Stickney said they were of good quality and quite productive; he would recommend them with winter protection; they were

not altogether satisfactory, but we had no variety of so good quality to take their place, that does not need the same protection. Clarke comes the nearest to them in quality, but not in fruitfulness.

On motion of Mr. Plumb, the Miami was placed first on the list.

Strawberries.— Mr. Plumb moved to add Green Prolific and Boyden's No. 30 to the list for general cultivation.

Mr. Kellogg stated that Green Prolific was a pistillate variety; with him was generally full of blossoms, but bore little or no fruit unless fertilized by some other variety.

Motion lost, and by unanimous consent the list was left unchanged, the Wilson alone.

Mr. Kellogg called for information in regard to Burr's New Pine and the Arena.

President Smith said that Burr's Pine was of superior flavor, but was very unsatisfactory in yield; so also with the Arena.

Mr. Peffer had cultivated it for years for home use; it was a very rich berry, but poor to yield.

Mr. Lawrence was inclined to favor Prouty's Seedling as second to Wilson.

Mr. Stickney said it was a very desirable variety; one objection was the shortness of the fruit stem; the first year with him it yielded equal to the Wilson; color was rather pale for market purposes; for family use and for yield it was equal to the Wilson; does not run to vines.

Mr. Plumb moved to add the Crescent Seedling to the list for trial.

Mr. Tuttle said that Mr. Henderson objected to the Crescent on account of quality of fruit; but he could not account for his taste. It has fruited with him the past season; the berries were large, fine looking and of good quality; the vine was a very strong grower and very productive. He had seen the original bed at New Haven, standing side by side with the Wilson and the Arena. The beds were three years old; the Crescent bed was entirely free from weeds while the others were overrun with them.

Motion to add the Crescent was carried, and the list was then adopted.

Pears.— The list of pears for trial was adopted as it stood last season.

PLUMS.—List rearranged so as to stand: Lombard, Imperial Gage, Miner (native), Magnum Bonum, Yellow Egg, Eldridge, Duane's Purple and De Soto (native).

Mr. Stickney was inclined, from what little experience he had had, and from accounts he had received, to think very favorably of the De Soto, but thought it was high time to strike the Miner off from the list. The tree grew very thrifty, was loaded with blossoms but bore no fruit. He knew of no good crops out of Galena.

Mr. Tuttle said there had been some good crops of the Miner near Baraboo, but in an experience of twenty-five years he had only raised three crops. It was the general impression that when the tree gets age, we shall hear better reports of it.

Mr. Stickney said his trees were ten years old, and six or eight inches through; he had had an abundance of blossoms, but not a sample of the fruit.

Mr. Kellogg's experience was much the same; he had one tree that had borne one crop, but all the others nothing.

EVERGREENS.—List adopted same as last year.

Mr. Stickney, as committee to confer with the State Agricultural Society in relation to the fair, reported as follows:

Gentlemen of the State Horticultural Society:—Your committee to confer with the State Agricultural Society would report, that the officers of said society are disposed to offer the same amount in premiums for the horticultural department as last year, in case the Horticultural Society do not secure the appropriation from the state applied for; in the event the appropriation is received, then each society to offer equal amounts, and any unawarded premiums to revert to the Horticultural Society.

Respectfully submitted,

J. S. STICKNEY.

Report adopted.

On motion of Mr. Plumb, Mr. Peter M. Gideon, of Minnesota, was made an honorary member of the society.

Society adjourned.

2 P. M.

The society was called to order by the president.

REORGANIZATION OF THE SOCIETY.—The committee appointed to consider the subject of applying to the legislature for an appro-

priation to aid in carrying on the work of the society, and for an increase of the number of pages and copies of its annual volume, made the following report:

Gentlemen of the State Horticultural Society:— Your committee respectfully report that in our judgment the society should make application to the state for aid in carrying on its work; and in view of thus being entrusted with the funds of the state, to be expended for the public good, and for the purpose of the better securing the aid sought, we would advise a reorganization of the society, making it representative in its character, and reporting to the governor direct, as to the work done, and the use of the means placed at our disposal.

We have, therefore, revised the paper referred to us, and present it in the following form, with recommendation that it be introduced at the present session of the legislature, as an act for the reorganization of the society.

The people of the state of Wisconsin, represented in senate and assembly, do enact as follows:

"Section 1. The executive committee of the Wisconsin State Horticultural Society shall hereafter consist of the president, secretary and treasurer of said society, and of one member from each congressional district of the state; said members from the congressional districts to be chosen annually by the county and local horticultural societies in the respective districts.

"Section 2. The present officers and executive committee of said society shall hold their respective offices until the Tuesday next succeeding the first Monday in February, 1880, and until their successors are appointed.

"Section 3. It shall be the duty of the said society to aid in the formation and maintenance of county and local horticultural societies; to promote the horticultural interests of the state by the holding of meetings for discussion; by the collection and dissemination of valuable information in regard to the cultivation of fruits, flowers and trees adapted to our soil and climate, and in every proper way to advance the fruit and tree growing interests of the state.

"Section 4. The annual meeting of the society shall be held on the Tuesday next succeeding the first Monday in February of each

year, for the election of its officers, the transaction of general business, and the consideration of questions pertaining to horticulture.

"Section 5. All vacancies in the offices of said society may be filled by the executive committee; and should there be a failure to elect a member of the executive committee in any district, the vacancy may be filled by a two-thirds vote of the members of the society present at any regularly appointed meeting.

"Section 6. It shall be the duty of the secretary of said society to make an annual report to the governor of the state, of the transactions of the society, including an itemized account of all moneys expended during the year, in addition to such matters as are now specified in the law relating to the same.

"Section 7. The number of printed pages of said report shall not exceed three hundred and fifty, and the number of copies shall be limited to three thousand five hundred. In all other respects, the publication and distribution of said report shall be in accordance with the provisions of the law now in force concerning the same.

"Section 8. The sum of $1,000 is hereby annually appropriated, out of any money in the state treasury not otherwise appropriated, to aid the said society in carrying out the provisions of this act; said sum to be paid by the state treasurer upon the order of the president of said society, in such sums and at such times as shall best contribute to the prosperity of the society and the interests it represents.

"Section 9. This act shall take effect and be in force from and after its passage and publication."

Respectfully submitted,

F. W. CASE,
J. C. PLUMB,
J. S. STICKNEY.

The report was accepted and adopted, and the duty of presenting the bill for the reorganization of the society to the legislature, was entrusted to Senator Anderson, with instructions to vary the conditions, if necessary to secure the desired aid.

REPORTS FROM FRUIT DISTRICTS.—Reports of observations were made by the committees present. (Reports for several of the districts were read at a later session, but are given here in their order, for convenience in reference.)

REPORT FROM THE FIRST DISTRICT — D. T. PILGRIM, WEST GRANVILLE.

COUNTIES — *Kenosha*, *Racine*, *Milwaukee*, *Washington* and *Ozaukee*. The land in this district may be stated as consisting of heavy timber, oak openings, and prairie. That which is cultivated may be more particularly described as composed of various gradations of clay, sand, gravel and loam. The hardiness and productiveness of orchards are greatest in the timber and least in the prairie soil. In common with all southern Wisconsin (at least as far as my observation and information has reached), the apple crop in this district was nearly a failure the past season. The trees put forth an abundance of blossoms in the spring, earlier by several days than usual. The cause of this was, no doubt, the open winter of 1877–8, which was almost warm enough at any time (with a few exceptions) to cause fruit buds to swell. Owing to some unknown cause, the fruit was injured soon after the blossoms fell. As to what this cause was hardly any two men agree, but to my mind the most plausible reason is, a slight frost soon after the blossoms fell, not quite hard enough to kill the fruit, yet hard enough to injure it, causing it to become scabby and grow in all imaginable shapes; some of it being almost bisected by natural causes, as it hung upon the tree; others were nearly natural in shape, but inferior in size and afflicted with scabs, causing the crop to be almost worthless. A good judge even could not tell the varieties apart. Some young orchards, however, situated in favorable places, were quite productive, and bore some very fair fuit. So far as my observation reached, the Russet family, the Wine Sop, Fameuse and Seek-no-Further were the best. These bore quite a fine crop in quantity, but not extra in quality.

The tame plum crop was very large and of splendid quality. Many of the trees were so heavily fruited that the limbs could not bear the weight, and either broke or had to be supported by props.

Pears, like plums, were a heavy crop, and of fine quality. Seldom do we see plum and pear trees so well ladened with fruit, and of such fine quality, as the past year.

Cherries were also a fine crop and of fine quality; ripened early, and were marketed at a comparatively low price.

Grapes, too, were an abundant crop, and ripened perfectly, the fine autumn weather being very favorable to the ripening of fall

fruits. Currants, gooseberries and raspberries were profusely abundant, making prices correspondingly low. The crop of strawberries was unusually large, and consequently sold at uncommonly low prices, being sold in Milwaukee at the remarkable low price of from 3 to 4 cents per quart.

A singular feature developed in the season was that the hardiest things suffered most. This was most noticeable in crab apples and wild plums, and I think was due only to the fact that these kinds started earlier and were more advanced at the time of injury. Some name blight, mildew, etc., as being active agents in causing the present bad health of our trees, but I think that if there had been no freezing, there would have been no foothold for these lesser evils; for never did trees commence to bud with greater promise of health and fruitfulness. Perhaps this was needed to complete our list of experiences, but as it has been thirty years in coming, so may it be thirty more, or twice that, to the next. Taking all the facts together, we should find no fault with the fruit we have received, as the deficiency in the apple crop has been largely made up by the profusion of small fruits.

Report of First district, continued.

G. P. PEFFER, PEWAUKEE.

In no season, except that of 1846, for thirty-seven years, which is as far back as I can recollect, have we had such peculiar and varied conditions of weather, extending to over the whole year. In 1846 we commenced working in the garden, sowing peas, planting onions, on the eleventh day of March. On the fifth of April our grain was all in the ground, sweet corn, potatoes, squashes and melons planted. That year melons were ripe on the fourth of July; plums and peaches on the twelfth of August. In November of 1846 there was some freezing weather, but it came off warm, and on Christmas day violets and daisies were in bloom in the garden, the same as this year. The past winter was very much like 1846, except less frost or cold weather in November. In fact, the whole winter was almost without freezing weather. The spring was also very favorable for early spring work. The season commenced four or five weeks earlier than usual. Digging could have been done in the nursery nearly all winter long, but we commenced digging trees in the nursery on the eleventh of March, and our spring grain was

all sowed before the first week in April. The month of April was very favorable, and the prospect for an abundant crop of fruit was very flattering, but the month of May was cloudy and cold and quite wet; June was much the same. All kinds of fruit trees were entirely covered with blossoms. Then cloudy weather set in, accompanied with cold east and southeast winds and cold rains; and the petals fairly rotted on the young sets before they were ripe enough to drop off. This generated a mildew, or fungus growth, which seriously affected the young fruit, and also the foliage of the trees. The leaves began to shrivel up, the trees stopped growing, and of course most of the fruit dropped off. What did not drop was attacked with a fungus, or scabby growth, covering both fruit, leaves and young wood with black spots. The effect of this fungoid growth was clearly seen with a magnifying glass, breaking down the inner tissues or lining of the leaf and fruit, and appropriating for its own development the pulp and sap designed for the leaf. This growth cannot do much damage to fruit trees except in very wet seasons; it is, however, seen very often on grape vines and gooseberries in dryer seasons. Some varieties were affected much less than others, and retained a portion of their fruit, while a few, located on high grounds, were not affected at all; also trees escaped injury that were situated near swiftly running streams. Quite a number of instances of this kind were seen within a few miles of us.

The varieties least affected with me, by this fungoid growth, are as follows, and in the order mentioned:

Duchess of Oldenburg, Wealthy, Golden Russet, Red Astrachan, Clark's Orange, Peffer's Winter, Pewaukee, No. 20, or Felix, Allen Russet, and Alexander.

Those most affected were Walbridge, Fameuse, Haas, Utters, Ben Davis, Fall Orange, Seek-No-Further, Talman Sweet, Northern Spy, St. Lawrence, Peffer's Golden, and Jonathan.

On the third of July we had the last rain for the summer. The soil was then so wet that it was impossible to work it, and the drought set in and continued so long, the ground became baked so hard that ordinary tools would make no impression on it. The drought continued almost three months, until the 28th of September. Some of the trees that had not dropped their fruit and whose foliage were not affected by fungi, matured their fruit, but made no wood growth; others more affected shed their leaves. Some of my

trees whose growth was stopped early in the season started out anew, and one of them was as full of blossoms on the 25th of July as in the spring.

Various means were tried to check the fungoid growth; unleached ashes, air slacked lime and sulphur mixed with earth were thrown into the trees when wet with dew. This may have done some good, but probably the dry weather destroyed the fungi, and gave a chance for new foliage to grow, perhaps enough to mature blossom buds for the coming year, but this will depend on the amount of vitality left in the trees, which I fear is not much, standing as they did all through the hot weather with very little foliage. The question is, will these trees ever be healthy again? They are certainly sick, as they made no healthy wood growth. Will not the spores of the fungi that dried up with those leaves germinate in the spring and destroy the new foliage again? I fear that they will, if the weather should be favorable, unless means are taken to destroy them.

SECOND DISTRICT — J. C. PLUMB, MILTON.

COUNTIES — *Rock*, *Walworth*, *Green*, *Dane*, *La Fayette*, *Iowa*. The past year has been one of great depression of the fruit interest of this district. It was our "apple year," and expectations were greatly exalted by the remarkably mild winter and the very abundant bloom of spring. All species of trees put forth a great show of blossom, some two weeks earlier than usual, but on the 13th of May came a severe freeze which destroyed all the native plum, and nearly ruined the trees. The apple was well out of blossom and was very generally badly cut off. The check which trees received, seemed to become a blight which affected some varieties more than others. Thus the Haas and Utters, in nursery and orchard, failed to make a fair growth during the season, even under good culture, and the fruit was generally worthless. The Talman and Fameuse were badly affected and failed to make their usual crop. The Golden Russet made the most abundant and perfect crop of fruit ever known in the state; while the Duchess fairly outdid itself.

This variation cannot be attributed to the May frost alone. There must have been atmospheric causes which succeeded the frost, causing the embryo fruit to drop even in localities where there was no frost apparent. Such was the case with the Univer-

sity orchard, at the state farm, Madison; which, however, bore heavily the previous year.

Within the confines of all our cities, trees generally bore more than an average crop. My theory is, that the vital forces of the trees were weakened by *too much moisture for the amount of heat.* The elaboration of fluids was not perfect; hence, a dyspeptic condition, unfavorable to the perfection of foliage and fruit.

Varieties with strong native elaborating power, went through all right. The Duchess and others of its class thus show their value for unfavorable situations and seasons. Fortunately, the over abundant apple crop of the eastern states gave us a generous supply at most reasonable rates.

The cherry and strawberry crop exceeded any ever before known in this district; the abundant rains of May and June rendering artificial irrigation superfluous.

The effect of this year's phenomena upon the next year's fruit and foliage is a question of much interest to the observer. The mild winter of 1877–8 was favorable to the early and strong development of insect life, and this in part may account for the failure of the apple crop in certain localities. The codling moth did not prevail as much as usual, but the leaf roller class and the loopers, or canker worms, were exceedingly abundant; also the currant worm. These worms are all readily and effectually disposed of by the use of arsenic in solution as before commended, only we find one pound to 100 gallons of water sufficiently strong, if thoroughly used.

The grape was less of a crop than for many years; the Concord being as usual the main crop. The finer varieties were nearly all badly effected with mildew, or some form of blight, particularly where they were closely summer pruned. Where left to wander at will, they perfected their fruit about as usual.

FOURTH DISTRICT — A. L. HATCH, ITHACA.

Counties — *Richland*, *Sauk*, *Vernon* and *Crawford*. Fruit trees last spring seemed to be quite unhurt by the previous winter. Buds had not started during winter, as was the case further south, but still came out in time to suffer with spring frosts, except on high sites. Grape buds in the valley were killed completely after starting, and barely escaped on the ridges. Then

succeeded cold, cloudy weather, the mercury indicating 40° above zero many nights in succession. As a result, apples grown on ridge land were terribly scabbed and cracked, three-fourths of some crops being worthless from these causes.

Since 1869, we have not had so rainy a season as the past. Rust, mildew and blight of the leaves nearly denuded some trees, especially Haas and Walbridge. In the latter part of the season, foliage was better and trees matured extremely well. The first fall frosts occurred in the valleys about the middle of September, and on the ridges a month later, thus making a practical difference in the ripening of grapes in favor of high sites.

INSECTS.— Measuring worms, such as we suppose to be canker worms, of three or four different styles, were very numerous. In the northern part of this county (Richland) and in the western part of Vernon, elm and basswood trees were almost entirely stripped of leaves by them. They gave some trouble in orchards, especially on young trees.

During hot weather plant lice were very plenty; in some cases injuring trees seriously. Phylloxera, the grape gall louse, we found on a wild vine. We may, therefore, conclude them to be "old settlers" here. On cultivated vines, we found leaf galls on one vine only, and that a Clinton, said to be quite subject to their attacks. We also ascertained that the root form of phylloxera may exist on vines where none of the leaf form can be found. Grasshoppers injured many young trees in clover fields, especially after harvest of fields of small grains near by, when the hoppers seemed to flock to the clover. For this reason we shall give up the idea of seeding young orchards to clover and mulching, as we have heretofore recommended.

FRUIT CROPS.— Owing to severe frosts in the spring, most fruit failed in the valleys, except an occasional patch of strawberries. On the ridges, a small crop of most fruits were grown, and on some protected sites apples were a good crop. Early in the season, apples from the ridges were offered quite freely in the home markets; principally Duchess, Fameuse and Golden Russet. The fruit decayed rapidly, and will seriously affect the reputation of home grown apples.

No grapes were grown generally, except on such sites as es-

caped spring frosts. We fruited the following, and they nearly all matured nicely except where vines lost their foliage: Concord, Delaware, Iona, Agawam, Wilder, Massasoit, Lindley, Salem, Merrimack, Janesville, Worden and Hartford. Loss of foliage is most complained of on Agawam and Delaware. Can it be attributed to exclusion of air from the soil by excessive moisture, thus smothering the rootlets? If so, is not culture and thorough aeration of the soil the remedy?

Green Prolific and Wilson strawberries produced most of the fruit in the home market, as far as we could judge. From four square rods of Wilson, we last spring took 1000 plants, and, in season, picked five bushels of berries as the third crop. Fully two-thirds of our raspberries blighted when half grown; others lost less. Plums, especially wild ones, usually abundant, were an entire failure. Hope the curculio will starve out.

Fruit Markets.— Early in the season home grown apples sold here at $1.00 per bushel. Later, imported apples sold at $2.10 to $2.50 per barrel. Grapes brought ten cents per pound in Richland Center, and strawberries sold in their season at ten cents and a shilling per quart, while in Milwaukee they retailed at $1.25 to $1.50 per 16 quarts crate. These facts suggest the possibilities of home markets for country fruit growers.

FIFTH DISTRICT — E. W. DANIELS, AURORAVILLE.

Counties.— *Green Lake*, *Waushara*, *Marquette* and *Winnebago*. I will endeavor, as in years past, to give you the scanty amount of information I have from time to time gathered, in journeyings through this fifth district.

First, the west part of our county, Waushara, and a part of Marquette, is too light a soil, except in a few favored localities, to raise the native or large varieties of apples to any great extent. But the Russian varieties, especially the Transcendent Crab, will flourish on any sand bank, and furnish the only apples upon which they can depend. But in the east half of Waushara, Green Lake Winnebago and a small portion of Marquette counties, are locations unsurpassed for a good quality of apples, as our friends well know by the exhibit at our fair. I have observed that the further north the Talman Sweet will grow, the larger and fairer the fruit, and less infested with the codling moth.

VARIETIES. — The Golden Russet, Duchess of Oldenburg, Fameuse and Fall Orange have been our most profitable trees for two or three years, but the Perry Russet has been nearly a total failure. A general complaint of their cracking at an early stage of their growth has steadily advanced for four or five years. I have never been fully satisfied as to the cause of this complaint; it is equally destructive upon young and thrifty trees as well as those in the decline of life. But little is known of the Walbridge and Plumb's Cider in this district. They do well in the nursery. Utter's Red, Westfield Seek-no-Further, Sweet Pear, Red Astrachan and St. Lawrence are moderately productive and hardy. The Sops of Wine seldom yields more than one-eighth of a crop, and not more than one-half of these ever arrive at full size and maturity. I think the Tetofsky is too slow a grower and moderate bearer for profit with us. I have a seedling, called Aurora Belle, which I grafted twelve years ago, that is large fruit, keeps as well as the Snow and is hardy as the Duchess; so say those who have raised and fruited it. I have also another variety, called Northwestern Greening, which I grafted first in 1873, and it has stood all our winters since. The fruit is very large, of a good flavor and keeps till spring. I exhibited fruit and wood at our meeting of 1875. I have one more seedling fruit and wood to exhibit at this meeting, to have its merits passed upon. I cannot pass to other fruits without speaking of the crab or Russian apples, which are of so much importance to those localities north and west. Our common kinds are so well known that they need no recommendation from me, but some of the newer kinds far surpass the old ones in size and quality. I have sixteen kinds from Minnesota. I think they originated with Jewell. Some ten have borne, four or five of which are fine eating apples, which ripen in September. But Whitney's No. 20 is certainly the finest and most rapid growing tree I ever saw. The fruit is represented to be very superior. Brier Sweet does well and the fruit is very fine.

Pears. — The Flemish Beauty is all we think of here. Those trees which stood the cold winter bore well the past year.

Plums, tame and wild, were a total failure from the effects of the frosts last spring.

Cherries.— The Early Richmond, common Red Morello and Kentish bore a larger crop than any for the last eight years.

Grapes are much neglected, and even ignored, as not one farmer in a hundred will listen or try to learn how to cultivate them, which I think as easy as hop culture. For varieties, I consider the Concord first for productiveness. I gathered nineteen pounds from one vine in 1877; last year only thirteen or fourteen pounds from a hill. Next, the Janesville produces well and comes into market first, making them very salable, though last spring the frost killed the first buds of the Janesville, while the other varieties escaped. For quality of fruit, I deem Roger's No. 9 and the Delaware first; then comes Salem, Roger's Nos. 5, 15 and 19. The amount of grapes cultivated in this district is limited to small lots near the towns along the Fox river. I have about one acre set.

Small Fruits. — Strawberries — The Wilson is the leading variety, though few are raised for sale. Raspberries occupy an important part in most of our gardens for home consumption. The Mammoth Cluster leads, but Philadelphia Red and Purple Cane do well. Blackberries — But few are grown, mostly the Ancient Britain, which endure the winter best.

The amount of tree planting in this district is increasing in spite of hard times. Since the cold winter, trees have lived and flourished better than before. The spring frost killed most of the apple and crab blossoms, or fruit sets, north and west of us. We had no fire blight on pear, apple or crab, and but a small amount of codling moth.

SEVENTH DISTRICT — D. HUNTLEY, APPLETON.

Counties. — *Outagamie*, *Shawano* and *Waupaca*. In my last report I stated that the winter had been favorable, and that we were expecting a good fruit season. But the hard winter is not the only enemy the fruit trees have to contend with. The apple trees blossomed very full, but were injured somewhat by a frost about that time or a little later. Still, I think there would have been as many left uninjured as the trees could have matured perfectly, or without injury from over-bearing; but as the apples began to appear, the trees were found to be infested with worms just hatching, and although we commenced killing immediately, or as soon as discovered, still they continued to increase, and it soon became evident that the whole time must be given to the

orchard in killing worms, or the apple crop would be a failure. Myself, with many others, devoted what time could be spared evenings, mornings, noonings, and occasionally an hour or two at other times, and still the worms increased; the result was about one-half or one-third of a crop on some of the best trees, and a total failure on others; perhaps one-fourth or one-fifth of a crop in all. In destroying the worms some adopted one plan and some another; using kerosene, soap suds, hot water, powder, burning with straw, etc., but the most successful method I heard of was killing by the hand, when clustered on limb or trunk of the tree. Many of our forest trees were perfectly stripped of leaves, especially the basswood, which greatly diminished the yield of honey. Many of the twigs are now encircled with eggs, and I think they should all be destroyed before the hatching season commences.

The last summer was a favorable one for the growth of young trees, and many more will be set the coming spring than for several years before; in fact the tree peddler is abroad, and making a specialty of some *wonderful* things, such as "pear trees grown on German stocks," at twelve dollars per dozen, which "are much more hardy than the hardiest iron clads and twice as profitable." Is it not strange that farmers do not buy direct from some well known nurseryman of their own state, or of responsible local agents. The old proved varieties are still the most in favor with the more intelligent. Of the new, the Tetofsky is looking the best of any. The Wealthy has not been fruited here yet. The Walbridge and Pewaukee do not meet the expectation, and will be set very sparingly in the future. The Ben Davis is such a nice grower and good bearer and keeper that more will be set in future than any other new variety, though we do not class it with the extra hardy.

Cherries were a full crop, and also strawberries. The Wilson is *the* berry. Grapes were also a good crop; no mildew, or if it appears, is immediately checked by the use of sulphur. Plums and pears not seen at all of late. No blight during last summer in this vicinity. The question is often asked among well informed fruit men, what is your best winter apple, all things considered, none being just satisfied with any that are hardy? The Golden Russet wilts badly, does not always ripen nicely, and is not good cooking. The Fameuse is the best, all things considered, and if picked early

and carefully barreled, will last till nearly spring. It is as hardy as any except, perhaps, the Duchess. The crabs are hardy, of course, but we must have something better. I fruited two trees of the Minkler this season which are very nice. Will report further next season.

NINTH DISTRICT — A. J. PHILLIPS, WEST SALEM.

COUNTIES.— *La Crosse*, *Trempealeau*, *Jackson*, *Buffalo*, and valleys of *Chippewa* and *St. Croix*. This is hardly deserving the name it bears, as it is hardly a township report. Were reports made out by some qualified person in each county, they would be made more accurate and interesting. The prospect last spring, so far as I know and can hear in this district, was good for a fine crop of fruit, but a frost in May, after apples were formed on the trees, froze them up, and only in some high locations was there any left. With the exception of a few plates, my apples were the only ones on exhibition at the fair in La Crosse county. This state of things was general over the district, as far as I have been able to learn. Some trees were bought and set last spring, but the sales this fall have been very light, owing perhaps to the hard times and the low price of farm produce as much as to the failure and destruction of the apple crop.

Wild plums, too, were almost a total failure. The most extensive orchardist in this district, to my knowledge, was the late F. Fleischer, of La Crosse, who died last fall; he had some five thousand trees of many varieties set in his orchard, and Mr. Wilcox informs me that, as a general thing, the trees look well. He was located on a bluff and in a valley, near the city of La Crosse. His health failing in the editorial room, he commenced horticultural pursuits to obtain more out door exercise, but he did not commence soon enough; his disease was so seated that his new and pleasant occupation could not arrest it. There is also a vacant chair across the river from this district; P. A. Jewell has passed away, like many others, just as he was placed in a comfortable position to live, and just as he was beginning to see his hopes realized in the fruiting of new varieties, which he thought were especially adapted to the northwest. Peace to his ashes! I think of him when I look at my fine Wealthy trees, which he sent me in the spring of 1875, and which fruited for the first time the past season.

Clark's Orange and Pewaukee bore some fine fruit the past season, in my orchard, also the No. 20 crab, which, when I tasted the fruit, made me glad that I ever formed the acquaintance of our friend Whitney. The Minnesota fruited, but not enough to give it a favorable report at this time. Our veteran friend Wilcox has moved or is moving his nursery from Trempealeau to La Crosse, showing by his actions that he has faith in high locations; hope he will succeed. I tried to have him come to this meeting, and if he had, I would have tried to have saddled this report on to him, as he is much better posted in the district than I am.

I had a good crop, say fifty bushels, of Transcendents, and a fair crop of standard apples the past season; saved, no doubt, from frost by the high location. The greatest treat I have enjoyed the past season was a visit from friend Stickney. He gave me some encouragement, and on his recommendation I will set fifty more pear trees next spring, Kellogg to the contrary notwithstanding. Mr. Wilcox visited my orchard, also Mr. Mathews, of the Northwestern nursery, at Baraboo. I believe this constitutes all the nurserymen I have seen on my grounds, and none of them advised me to stop, so I will try it another year. I find that a person engaged in horticultural employments is always learning something new, especially if he or she are trying to inform themselves. I found out something this winter that was new to me, and I will give the public the benefit of it, but don't want much said about it. A farmer in my town said to me: "Are you going to buy any trees for your neighbors this spring?" I said, "Yes, if they want them." "Well," he said, "I will give you three dollars for six good Baldwin trees; I bought a barrel of that fruit last fall, and I like it, as it is better than any apple I ever raised." I said, "I fear it is not hardy enough." He said, "yes it is;" and said he, "I have found out the whole secret of this business; nurserymen, knowing the value of the fruit, do not sell the trees broadcast over the country, but confine their sales near home, to their particular friends, thereby monopolizing the trade in that fruit." Being somewhat acquainted with a few nurserymen, the story looked so reasonable that I did not dispute him, and as he did not place me under bonds of secrecy, I tell it.

From what information I can gather and what I have seen, trees went into winter in good shape, and everything looks favorable for

a fair crop in 1879. The thermometer has only been down to twenty-four degrees, at my place, but the present and continuing warm weather may start the trees too early. The only way is to hope for the best.

ELEVENTH DISTRICT — C. W. HUMPHREY, MITCHELL.

COUNTIES — *Sheboygan*, *Calumet* and *Manitowoc*. Had I been requested to make a report on fruit five or six years ago, I should have been as ready to tell you what I knew about fruit as the late Mr. Greeley was to tell "what he knew about farming." But times have changed, and men often change with them. There was a time when I thought I knew a great deal about fruit (apples), but recent developments have satisfied me that I don't know much about this subject. Once, without reserve, I should have been willing to give a good deal of advice, but now I can only slightly record my observations and my experience.

In the first place, I live upon oak land, the native timber of which is white and red oak, with a good deal of hickory, iron wood, black cherry and, in fact, a good sprinkling of all kinds of timber. The soil is common to that kind of timber, and is what I call a light clay, or marl, of a calcareous nature, partaking some of sand and gravel, with a tenacious red clay and limestone, gravelly subsoil. From my observations fruit trees do as well, or better, on this kind of soil than on any other with which I am acquainted.

It is said we often learn as much by a failure as a success. So we do. And knowledge thus acquired is often more expensive and lasting than successful knowledge. Thirty-one years ago last fall I set a few apple trees on the farm where I now live. Many of them are good, thrifty trees to-day. The English Golden Russet, the Russet with light colored speckled wood, and the Westfield Seek-No-Further are thrifty, good bearing trees. One early Sour Bough bears good crops every other year. The balance of the few trees first set have long since gone the way of all the earth. I do not know what varieties they were.

I once thought protection was essential to successful fruit growing; then I thought it was not; but now again I think it is. But on which side? that's the question. I would give, as my opinion, that the west, northwest and southwest are the points against which an apple orchard needs the most protection. Some of the best

orchards within my knowledge are fully exposed from the northeast, but the lands, also, on which the trees are planted descend considerably in the same direction, while the orchard sites are well protected from the southwest, and quite well from the west by natural barriers. These observations, coupled with my own experience in my two orchards, lead me to think that western and southwestern protection are the most effectual.

My old orchard is quite well protected on the southwest and west by the site descending gently to the east, and also by the fences, building and natural shrubbery, which is not a little, about the house, while my young orchard, which was set when I thought I knew a thing or two, and fully exposed from the southwest and west, has nearly died out again and again; for it has been reset, some parts of it, as many as three times, and with most of the ironclads at that. I should say, however, that one little corner of about a dozen trees, where the land descends a trifle to the northeast, the trees are all doing well. These trees are the Talman Sweet, Haas, and Westfield Seek-No-Further.

Now for the old orchard. Here the trees are doing reasonably well. Still, the Fameuse that were set in the spring of 1862, all or nearly all have dead spots on the southwest side of the body, extending as much as half way round the trunk. These trees are all so low headed that the ends of the lower limbs lay upon the ground during the fruiting season. The St. Lawrence, fifteen in number, are all doing well, bearing each alternate year heavy crops of very fine fruit. The Benoni is thrifty and bears full crops. The Dominie is a very flattering grower but a very shy bearer. The fruit is excellent. The Rambo did well for about ten years, when it rapidly declined; ditto the Keswick Codlin. The Colvert is healthy and a regular but moderate bearer. The Red Astrachan and Sops of Wine are good strong growers, and regular bearers, and produce yearly, remunerative crops. The Little Red Romanite is worthless as a fruit. It is well adapted for the boys to stone squirrels and hogs with, for nothing will eat the fruit. I have not grown the Tetofsky long enough to pronounce on its merits; so also of the Haas and Ben Davis. From my experience and observation, I would not recommend planting the latter in this locality. Some of the best trees among the old ones about here, are the Northern Spy, but I think their long life is generally traced

to the fact that they have stood in grass. The Yellow Bell Flower is a moderate grower and a tardy bearer. I have grown more bushels of the Fameuse from the same number of trees than I have single apples of this variety, both trees planted at the same time, and both receiving the same care. The fruit is not fair.

From my experience and observation, if I were called upon to select a list of apple trees to be planted in this locality, I would choose the following, to wit: Red Astrachan, Sops of Wine, St. Lawrence, Benoni, Fameuse, Dominie, Talman Sweet, Seek-No-Further, and English Golden Russet.

I have set a good many pear trees, but they have all ended in failure and disappointment; only two remain as mementoes of my faith in this line. Several of them grew so as to bear fine fruit, flattering me only to disappoint. One Rositzer and one Flemish Beauty still maintain a precarious existence, the latter producing a little fruit each year.

The common red, or sour, or Morello Cherry does well here, and bears regularly fair crops. Farmers have long since ceased setting any other.

Plums are "Nix-come-rouse;" but very few in the county. But little or no attention is given to grapes, raspberries and blackberries. Strawberries are successfully cultivated in several localities as a market fruit. Of currants, all can have them in abundance, by a little effort.

In this report I have not told you anything I don't know, and not much that I do. I regret I can't be with you, and hope your meeting will be both amusing and instructive.

Twelfth District — J. M. Smith, Green Bay.

Counties — *Brown*, *Kewaunee*, *Door* and *Oconto*.—My report from this district this season will be very short. It really seems as if the long night of discouragement in apple and pear growing in this portion of our state is about ended. People no longer purchase indiscriminately of any one who comes along, as they did twenty years since, neither do they refuse absolutely to purchase of any one, as they have generally done for a number of years past. A few of our standard trees when well set, on reasonably good locations, and properly cared for, bid fair to become profitable. In fact, a few of them are already so. The crops of apples, pears,

cherries, currants, strawberries, raspberries and wild blackberries were all good; the grape crop only moderate.

Of apples, the Duchess holds its own at the head of the list, for a fall apple; Fameuse for early winter. If I were so situated that I could set an orchard of one thousand trees, I should surely make more than half of them Fameuse. The balance would be divided among very few varieties. Some Walbridge trees set lately in this district promise splendidly. I know of none in bearing about here. A few pear trees are also being set, principally of the Flemish Beauty. But very few strawberries are seen in our market except the Wilson. Of raspberries, the Doolittle, Miami and Philadelphia lead all others. No blackberries are cultivated about here. Currants, with reasonably good care, have not failed of a crop for more than twenty years. The red and white Dutch are the principal ones in cultivation.

But few new varieties of grapes have been tried lately. A number of those now under cultivation are doing so well wherever they have a fair chance, that it seems as if every farmer ought to be well supplied with this delicious fruit. Still such is not the case. In fact, but few of them have a reasonable supply of them. Delaware, Concord, Janesville, Rogers' Nos. 3, 4, 9, 15, 19 and some others, all do well. In fact, although we are yet in our infancy in fruit growing, I am satisfied that the time is coming, and I hope is not very far in the future, when this district will have an abundant supply of fruit, not only for home use, but for others in locations not so well situated as ourselves for this purpose.

TREASURER'S REPORT.—The following communication was received from the treasurer:

To the officers of the Wisconsin State Horticultural Society:

Your treasurer wishes to report that the receipts and disbursements of the society for the past year have been as follows:

1878.		*Dr.*	*Cr.*
Feb. 5.	By balance		$131 19
Feb. 15.	By cash from F. W Case, membership		29 00
Feb. 15.	To voucher No. 100	$100 00	
May 11.	To check to F. W. Case, postage	7 00	
May 11.	By cash from F. W. Case, membership		3 00
June 3.	To voucher No. 101, postage	10 00	

1879.		*Dr.*	*Cr.*
Feb. 4.	To voucher No 102, printing	$5 25	
Feb. 4.	By membership		$5 00
Feb. 4.	Balance	45 94	
	Total	$168 19	$168 19

Respectfully submitted,

Matt. Anderson, *Treasurer.*

On motion, the report of the treasurer was accepted and adopted.

The report of the superintendent at the fair was called for, and read as follows:

EXHIBITION IN THE HORTICULTURAL DEPARTMENT AT THE STATE FAIR OF 1878.

REPORT OF THE SUPERINTENDENT.

Gentlemen of the State Horticultural Society: As the time for our exhibition drew near, great apprehension was felt by your superintendent, and many others, least the display of fruit should be very far from satisfactory. The remarkably fine promise of the early part of the season had been seriously blighted by hard frosts in May and the series of cold winds and storms that followed, and was still further impaired by extremes of heat in midsummer and excess of rain in the interior portion of the state, and severe droughts on the lake shore. With these facts in view, the outlook was rather discouraging, and this was intensified by the assurance of the other officers of the fair that "our display would be a failure;" that "we would not need one-quarter of the hall assigned us, and that we would be lost in such a large building." Urged on by our own fears and a desire to prove these prophecies false, extra efforts were made to draw out, at least, a creditable display of fruit and flowers. The appeals to our horticultural friends were well responded to, and the result was a happy disappointment to all. Our hall, 40 by 90 feet, was well filled; so well, in fact, that many of the exhibits were crowded into so small spaces, as not to show to advantage. It was frequently remarked by those passing through, that "the display was the finest on the ground," "better than it had ever been before."

One noticeable feature of the exhibition was that some of our

oldest and best fruit growers were not represented in their usual places, as the accidents peculiar to the season had borne heavily upon them, but the extra efforts of others more than made up the deficiency. Two thousand plates were provided for the occasion, but this was not sufficient, and many collections were grouped on the tables alone.

It is perhaps invidious to speak of individuals where all did so well, and should receive credit for their efforts; yet it is but just to speak of the fine display of apples shown by friends Peffer, Plumb, Kellogg and Palmer, among the professional cultivators, most of whom had on exhibition many varieties not entered for competition; also of Messrs, Phillips, Jeffreys, Lewis, Taylor, Willson, Martin, Sherman and Boyce, among the non-professionals.

The early date at which the fair was held, sadly affected the show of grapes, but most of the leading grape growers were present, and in their exhibits, well represented the capabilities of this state to produce this luscious fruit in abundance and of extra quality.

Another remarkable feature of the exhibition was the unusual display of pears, both in numbers, variety and quality. Many of these exhibits were from what is termed the lake shore belt, but there were quite a number of fine collections from the interior and even the western borders of the state. One of the finest collections of pears ever exhibited at our fairs, was that brought from the well known pear orchard near Green Bay. While this does not make it advisable to recommend the extensive cultivation of the pear, it shows us that there is good reason to hope for success in this direction.

The remarkably fine exhibition of fruit from the northern part of the state should be mentioned in this connection. Some of the finest fruit, and that too of varieties regarded as not sufficiently hardy to be cultivated in the southern part of the state, even in the most favorable locations, were here to be seen, mature in size and of a superior quality, grown to very near, if not beyond, the limits where successful fruit culture is generally regarded as practicable. The exhibitions of friends Phillips from La Crosse county, and Reynolds from Brown county, demonstrate the capabilities of the northern portion of the state for raising fruit, and give encour-

agement to hope that when we learn the requisite conditions of soil and location and the proper culture, a large portion of our state that now depends on others for their fruit, will find that it can be raised at home; for surely there are many places where the like conditions can be found and like results secured.

We were also greeted with the sight of a number of plates of a fruit that in days past has formed a prominent part of our exhibitions, but which, alas! has long since been shamefully deserted and given up to the tender mercies of the curculio.

There were also a few specimens of home grown peaches on the tables, fair to look upon, but "sour grapes" to the fruit growers of Wisconsin.

The exhibition of plants and flowers was very creditable. Prominent among the exhibitors of flowers, we would mention Mrs. Boyce of Lodi, Mrs. Mallory of Waukesha, Mrs. Robt. Boyd of Evansville, Miss Leitch, the Mrs. Marston, Heistand, Joy and Pitman of Madison, Mrs. Leitch of Dane and Miss Kate Peffer of Pewaukee.

The display made by Mr. Wm. Kitzrow, professional florist of Milwaukee, is worthy of commendation. The collection was large in number of varieties and choice in quality. It contributed much to the attractiveness of the hall; without it the display of greenhouse plants would have been meagre.

The number of entries fails to giving a correct idea of the extent of the exhibition, as many exhibits were duplicated and others were far in excess of the number required, and many articles were placed on exhibition which were not entered for competition. In the professional department, the number of entries made was 167; in the non-professional, 361. The amount of premiums paid to professional cultivators, was $251; to non-professional, $317; total $568.

Certain things that transpired in connection with the management of the department make a few suggestions, pertaining to needed regulations for the future, pertinent to this report. Many of you are aware that on the second day of the exhibition it became necessary to provide more table room to properly display the fruit. As all the other space was occupied to the fullest capacity, it was found necessary to close the side entrance to the hall. The result proved that the interests of two or three hucksters engaged in

selling pop, peanuts and cigars, in coops at the outside of the entrance were of vastly more importance than the comfort and convenience of the exhibition within, and consequently, the tables had to be removed and the door opened. Further, in certain states of the weather and direction of the wind, it was desirable to have this entrance closed in order to protect the plants and flowers, and to promote the comfort of those within; but as this would interfere with vested rights, the inconvenience and discomfort had to be endured. It therefore seems desirable, that, if arrangements are to be made by the society to take charge of the horticultural department in the future, it should be specified that the society should have full control of the hall and its surroundings, as far as may be necessary for the proper management of the department.

Another suggestion is, that by giving more force and prominence to some of the rules governing the exhibition, better satisfaction would be given, and there would be less friction in its management. There seems to have been a gradual increase of laxity in the strict enforcement of the rules, whether owing to the sensitiveness of the judges, or the lack of proper attention on the part of the superintendent, it occasions much dissatisfaction to exhibitors, and is alike impolite and unjust. To specify particular points: the rule that the article exhibited must be entered in the name of the party who raised or made it, is very apt to be disregarded, and there is no doubt, that at every fair, there are instances where the exhibitor is the collector, rather than the producer of the articles entered in his name. A strict observance of this rule should be insisted upon. So also with relation to the rule specifying the time at which the articles must be in their place on the tables; the least departure from it is a fruitful source of complaint and hard feeling. The rules governing entries and arrangement of the general exhibition are made by the Agricultural Society, and there may be instances where they, for some cause, deviate from the strict enforcement of them, which may give dissatisfaction; this is beyond our control, but by strictly enforcing the rules, as far as may be in our power, we will do much to relieve the dissatisfaction often felt and expressed. I would in this connection suggest, that we would probably secure a better observance of the rules on the part of exhibitors, and also a more prompt enforcement of them by the judges and officers of the department, if the most important ones

were briefly but plainly stated in the notes at the head of our department list of premiums.

There is generally much delay in securing the proper arrangement of the floral display at our fairs, which is, in part, owing to the amount of time required to do this work satisfactory, and also to the perishable nature of the flowers, and I would suggest the advisability of extending the time for the final arrangement of cut flowers on the tables. If it were possible to extend this time until Tuesday evening at 6 P. M., or even Wednesday morning 9 A. M., with the strict enforcement of the regulation that at that hour the books are to be placed in the hands of the judges, and no addition or change will be allowed to the exhibits then on the tables, we would give better satisfaction to the exhibitors, and make it much easier for the judges to pass upon the merits of the exhibits, as they would be in a much more perfect condition. These considerations are respectfully submitted.

The following is the list of premiums awarded in the fruit and flower department:

PREMIUMS AWARDED in the Fruit and Flower Department of State Fair of 1878:

Fruit by Professional Cultivators.

APPLES.

Best display of varieties, not to exceed 30, L. L. Kellogg, Janesville.	$10 00
Second best, Wm. Reid, North Prairie	7 50
Third best, N. N. Palmer, Brodhead	5 00
Best ten varieties adapted to the Northwest, Geo. P. Peffer, Pewaukee	7 00
Second best, L. L. Kellogg	5 00
Third best, Wm. Reid	3 00
Best five varieties adapted to the Northwest, J. C. Plumb, Milton	3 00
Second best, L. L. Kellogg	2 00
Third best, N. N. Palmer	1 00
Best variety of winter, not to exceed ten, Geo. P. Peffer	5 00
Second best, L. L. Kellogg	3 00
Third best, Wm. Reid	2 00
Best five varieties of winter, J. C. Plumb	3 00
Second best, Geo. P. Peffer	2 00
Third best, L. L. Kellogg	1 00
Best ten varieties, large and showy, L. L. Kellogg	5 00
Second best, Wm. Reid	3 00
Third best, N. N. Palmer	2 00
Largest apple, J. C. Plumb	1 00
Heaviest apple, J. C. Plumb	1 00

PEARS.

Best display of varieties, Geo. P. Peffer	$3 00
Second best, Wm. Reid	2 00
Third best, N. N. Palmer	1 00
Best three varieties, Geo P. Peffer	2 00
Second best, N. N. Palmer	1 00
Best Flemish Beauty, Wm. Reid	2 00

PLUMS.

Best and greatest variety, Geo. P. Peffer	$3 00
Third best, Wm. Reid	1 00
Best Miner, Geo. P. Peffer	2 00
Best native, or wild, Geo. P. Peffer	1 00

F. C. CURTIS,
A. J. PHILIPS,
W. REYNOLDS,
Committee.

GRAPES.

Best and greatest display of varieties, C. H. Greenman, Wauwatosa.	$10 00
Second best, Wm. Reid	7 50
Third best, N. N. Palmer	5 00
Best ten varieties, C. H. Greenman	7 50
Second best, Wm. Reid	5 00
Third best, N. N. Palmer	3 00
Best five varieties, J. C. Plumb	3 00
Second best, C. H. Greenman	2 00
Third best, N. N. Palmer	1 00
Best three varieties, C. H. Greenman	3 00
Second best, J. C. Plumb	2 00
Third best, N. N. Palmer	1 00
Best two varieties, C. H. Greenman	2 00
Second best, Wm. Reid	1 00
Best single variety, C. H. Greenman	2 00
Second best, Wm. Reid	1 00
Best three bunches of Concord on one cane, Wm. Reid	2 00
Second best, C. H. Greenman	1 00
Best three bunches of Delaware on one cane, Wm. Reid	2 00
Second best, C. H. Greenman	1 00
Best single variety, quality to rule, C. H. Greenman	3 00
Second best, Wm. Reid	2 00
Best show of foreign, Geo. P. Peffer	3 00

CRABS.

Best and greatest variety, named, N. N. Palmer	$3 00
Second best, Wm. Reid	2 00
Third best, Geo. P. Peffer	1 00
Best plate Hyslop, H. Schuster, Middleton	1 00
Best plate Transcendent, N. N. Palmer	1 00
Best seedling, Geo. P. Peffer	2 00
Second best, J. C. Plumb	1 00

SWEEPSTAKES ON FRUIT.

Best collection of fruit of all kinds, Geo. P. Peffer	$7 50
Second best, L. L. Kellogg	5 00
Third best, N. N. Palmer	3 00

D. T. PILGRIM,
J. M. SMITH,
A. J. PHILIPS,
Committee.

Fruit by Non-Professional Cultivators.

Best and greatest display of varieties, not to exceed thirty, A. J. Philips, West Salem	$10 00
Second best, P. J. Foster, Rock Spring	7 50
Third best, Henry Taylor, Middleton	5 00
Best ten varieties adapted to the northwest, A. J. Philips	7 00
Second best, Mrs. A. A. Boyce, Lodi	5 00
Third best, A. Sherman, Janesville	3 00
Best ten varieties, large and showy, H. C Willson, Madison	5 00
Second best, A. J. Philips	3 00
Third best, Mrs A. A. Boyce	2 00
Best five varieties adapted to the northwest, A. J. Philips	3 00
Second best, E. D. Lewis, Lake Mills	2 00
Third best, A. Sherman	1 00
Best and largest variety of winter, not to exceed ten, A. J. Philips	5 00
Second best, L. Martin, Brown Co.	3 00
Third best, Geo. Jeffery, Smithville	2 00
Best five varieties winter, A. J. Philips	3 00
Second best, L. Martin	2 00
Third best, E. D. Lewis	1 00
Largest apple, H. A. Lewis, Madison	1 00
Heaviest apple, H. C. Willson	1 00

PEARS.

Best and greatest display of varieties, Geo. Jeffery	$3 00
Second best, J. Y. Ozanne, Racine	2 00
Third best, L. Martin	1 00
Best three varieties, L. Martin	2 00
Second best, Geo. Jeffery	1 00
Best Flemish Beauty, L Martin	2 00

PLUMS.

Best and greatest variety, D. T. Pilgrim, West Granville	$3 00
Second best, Geo. Jeffery	2 00
Third best, John Spaulding, Janesville	1 00
Best native or wild, D. T. Pilgrim	1 00

We find on exhibition, by P. J. Foster of Sauk county, a plate of Flemish Beauty pears, which were not entered, but which are superior in size to any competing.

Also, a fine collection of named apples, from James Barr of Jefferson, and a similar one from the Green County Agricultural Society.

Also, a basket of peaches, grown in the city of Madison, by J. E. Squiers which are large, late and fine.

All these exhibits are worthy of commendation in the opinion of the committee.

GEO. P. PEFFER,
W. W. DANIELLS,
J. C. PLUMB,
Committee.

GRAPES.

Best and greatest display of varieties, V. Lowe, Palmyra	$10 00
Second best, Isaac Adams, Door Creek	7 50
Third best, F. S. Lawrence, Janesville	5 00
Best ten varieties, V. Lowe	7 50
Second best, F. S. Lawrence	5 00

Best five varieties, V. Lowe	$3 00
Best three varieties, V. Lowe	3 00
Second best, H. C. Willson	2 00
Best two varieties, H. C. Willson	2 00
Second best, V. Lowe	1 00
Best single variety, V. Lowe	2 00
Second best, H. C. Willson	1 00
Best three bunches of Concord on one cane, H. C. Willson	2 00
Second best, V. Lowe	1 00
Best three bunches of Delaware on one cane, V. Lowe	2 00
Second best, Isaac Adams	1 00
Best single variety, quality to rule, V. Lowe	3 00
Second best, Isaac Adams	2 00

CRABS.

Best and greatest variety named, A. J. Philips	$3 00
Second best, H. C. Willson	2 00
Third best, Geo. Jeffery	1 00
Best plate Hyslop, A. J. Philips	1 00
Best plate Transcendent, A. J. Philips	1 00

Two seedling crabs exhibited by A. J. Philips, commended.

SWEEPSTAKES ON FRUIT.

Best collection of fruit of all kinds, Geo. Jeffery	$7 50
Second best, D. T. Pilgrim	5 00

M. J. PLUMB,
C. H. GREENMAN,
N. N. PALMER,
Committee.

SEEDLING APPLES.

Best seedling apple, A. J. Philips.
Second best, A. J. Philips.

C. H. GREENMAN,
GEO. JEFFERY,
N. N. PALMER,
Committee.

NURSERY TREES.

Best collection of nursery grown trees, quality to rule, J. C. Plumb,	Dip.
Best collection of evergreens, J. C. Plumb	Dip.
Best collection of fruit trees, J. C. Plumb	Dip.
Best collection of hardy flowering shrubs, J. C. Plumb	Dip.
Best collection of apple trees, J. C. Plumb	Dip.

C. H. GREENMAN,
GEO. JEFFERY,
N. N. PALMER.
Committee.

Flowers, by Professional Cultivators.

Best floral design, Wm. Kitzrow, Milwaukee	$5 00
Second best, H. G. Roberts, Waukesha	3 00
Best collection of cut flowers, Wm. Kitzrow	4 00
Second best, H. G. Roberts	3 00
Best pyramidal bouquet, Wm. Kitzrow	3 00
Second best, H. G. Roberts	2 00
Best pair of flat bouquets, Wm. Kitzrow	2 00
Best bouquet of everlasting flowers, Wm. Kitzrow	3 00
Second best, H. G. Roberts	2 00
Best ten named dahlias, J. C. Plumb	2 00

Second best, Wm Kitzrow	$1 00
Best display of roses, Wm. Kitzrow	4 00
Best five named varieties of roses, Wm Kitzrow	3 00
Best display verbenas, Wm. Kitzrow	2 00
Best show of double petunias, Wm. Kitzrow	1 00
Best show gladiolas, Wm. Kitzrow	1 00
Second best, J. C. Plumb	50
Best show green-house plants, not less than 50 nor more than 100, Wm. Kitzrow	7 50
Best twenty varieties green house plants in bloom, Wm. Kitzrow	3 00
Best ten geraniums Wm. Kitzrow	3 00
Best six fuchsias, Wm. Kitzrow	2 00
Best display of flowers of all kinds raised by exhibitor, Wm. Kitzrow	5 00
Best display ornament foliage plants, not more than fifteen varieties, Wm. Kitzrow	3 00

A fine collection of dahlias, exhibited by J. C. Plumb & Son, are worthy of special mention. A collection of twenty-one varieties named and in very fine condition are deemed worthy, by the committee, of a special premium of three dollars. The competition on gladiolas was very close.

Wm. Kitzrow, of Milwaukee, deserves a vote of thanks, in addition to the premiums awarded, for the attractiveness of his large collection of plants and flowers.

GEO. J. KELLOGG,
MRS. H. R. RYAN,
MRS. A. A. BOYCE,
Committee.

Flowers by Non-Professional Cultivators.

Best floral design, Miss Kate F. Peffer, Pewaukee	$5 00
Second best, Wm. T. Leitch, Jr., Dane	3 00
Third best, P. W. Brown, Madison	2 00
Best collection of cut flowers, Mrs. John Joy, Madison	4 00
Second best, Mrs A. A. Boyce	3 00
Third best, Wm. T. Leitch, Jr	2 00
Best basket of flowers, Mrs. J. Joy	3 00
Second best, Miss Kate F. Peffer	2 00
Best pyramidal bouquet, Miss Kate F Peffer	3 00
Second best, Miss Abbie Deards, Madison	2 00
Best pair round bouquets, Miss Kate F. Peffer	3 00
Second best, Wm. T. Leitch, Jr.	2 00
Best pair flat bouquets, Mrs. Robert Boyd	2 00
Best bouquet of everlasting flowers, Mrs. Robert Boyd	3 00
Second best, C. Wildhagen, Madison	2 00
Best display dahlias, not more than twenty varieties, Mrs. Robert Boyd	3 00
Second best, Miss Kate F. Peffer	2 00
Best ten named dahlias, Miss Kate F. Peffer	2 00
Second best, Mrs. John Joy	1 00
Best display of roses, Mrs. Geo. F. Brown, Madison	4 00
Best five named varieties roses, Mrs. J. R. Heistand, Madison	3 00
Best display verbenas, Mrs. Geo. F. Brown	2 00
Second best, Mrs. J. T. Marston	1 00
Best named verbenas, Mrs. J. C Squires, Madison	2 00
Second best, Miss Kate F. Peffer	1 00
Best show seedling verbenas, Mrs. J. T. Marston	2 00
Second best, C Wildhagen	1 00
Best show asters, Mrs. W. G. Pitman, Madison	2 00

Second best, C. Wildhagen	$1 00
Best show perennial phlox, Mrs. John Joy	1 00
Second best, Mrs. A. A. Boyce	50
Best show pansies, Miss Abbie Deards	1 00
Second best, Mrs. J. T. Marston	50
Best show double petunias, Mrs. A. A. Boyce	1 00
Best show dianthus, C. Wildhagen	1 00
Second best, Z. L. Welman, Stoughton	50
Best show of gladiolas, Mrs. A. A. Boyce	1 00
Second best, Mrs. John Joy	50
Best show phlox drummondii, Mrs. J. T. Marston	1 00
Second best, P. W. Brown	50
Best show lilies, Mrs. Geo. F. Brown	1 00
Best show stocks, Mrs. A. A. Boyce	1 00
Best show balsams, Mrs. John Joy	1 00
Second best, Miss L. Campbell, Madison	50
Best show green house plants not less than twenty-five nor more than fifty, Mrs. John Joy	5 00
Best ten varieties green house plants in bloom, Mrs. W. G. Pitman.	3 00
Best ten geraniums, Mrs. John Joy	3 00
Second best, Mrs. W. G. Pitman	2 00
Best display of flowers raised by exhibitor, Mrs. A. A. Boyce	5 00
Second best, Miss Kate F. Peffer	3 00
Best display ornamental foliage plants, Mrs. W. G. Pitman	3 00
Second best, Mrs. L. F. Mallory	2 00

GEO. J. W. KITZROW,
MRS. M. M. DAVIS,
MRS. H. R. RYAN,
Committee.

Special Premiums.

JAMES VICK'S, OF ROCHESTER, N. Y.

Best collection cut flowers, Mrs. W. G. Pitman	$20 00
Second best, Mrs. L. F. Mallory	10 00
Third best, Mrs. Robert Boyd	5 00
Fourth best, Mrs. J R. Heistand	Floral Chromo.
Best ornamental floral work, Wm. T. Leitch, Jr.	5 00

MADISON HORTICULTURAL SOCIETY'S.

Best collection of wild flowers, ferns and mosses, Miss C. W. Sharp, Madison ..... Imported canary and gilt cage.
Second best, Miss Kate F. Peffer ..... Silver vase.
Best collection of flowers, arranged and exhibited by boy or girl under sixteen years of age, Miss Jennie Leitch, Madison.....
Silver pickle castor.

GEO. J. W. KITZROW,
MRS. H. R. RYAN,
Committee.

Respectfully submitted, F. W. CASE,
Superintendent.

The report of the superintendent was accepted and adopted.

On motion of Mr. Stickney, the committee on the revision of the premium list were instructed to give the main regulations governing the entry and exhibition of articles in the fruit and flower de-

partment, at the head of the list, and to extend the time for the final arrangement of cut flowers till Wednesday morning, 9 A. M.

It was also decided to give the superintendent instructions to secure full control of the hall and its entrances for the horticultural department at the fair, to be used so as best to promote the purposes of the exhibition.

CONSTITUTION AND BY-LAWS AMENDED. — The committee to whom was referred the amendment of the constitution and by-laws of the society reported, recommending the adoption of the following:

CONSTITUTION.

ART. I. This society shall be known as the Wisconsin State Horticultural Society.

ART. II. Its object shall be the advancement of the science of horticulture.

ART. III. Its members shall consist of *annual* members, paying an annual fee of one dollar; of *life* members, paying a fee of ten dollars at one time; of *honorary life* members, who shall be distinguished for merit in horticultural or kindred sciences, or who shall confer any particular benefit upon this society; and *honorary annual* members, who may, by vote, be invited to participate in the proceedings of the society.

ART. IV. Its officers shall consist of a President, Vice-President, Recording Secretary, Corresponding Secretary, Treasurer, Superintendent, and an Executive Board, consisting of the foregoing officers and additional members, one from each congressional district of the state, five of whom shall constitute a quorum at any of its meetings. In addition to the foregoing officers, the presidents of all local horticultural societies reporting to this society, shall be deemed honorary members and *ex-officio* vice presidents of this society. All officers shall be elected by ballot and shall hold their office for one year thereafter, and until their successors are elected; provided, the additional executive members may be elected by the county or local horticultural societies of their respective districts.

ART. V. The society shall hold annual meetings, commencing on the Monday next preceding the first Tuesday in February, for the election of officers, for discussions and for the exhibition of

fruit; also one meeting during the fall, for the exhibition of fruits and for discussions, and such other meetings for discussion and exhibition as the executive committee may direct, at such time and place as the executive board shall designate.

ART. VI. This constitution, with the accompanying by-laws, may be amended at any regular meeting, by a two-thirds vote of the members present.

BY-LAWS.

I. The president shall preside at meetings, and with the advice of the recording secretary, call all meetings of the society, and have a general supervision of the affairs of the society; and shall deliver an annual address upon some subject connected with horticulture.

II. The vice-president shall act in the absence or disability of the president, and perform the duties of the chief officer.

III. The secretary shall attend to all the correspondence, shall record the proceedings of the society, preserve all papers belonging to the same, and superintend the publication of its reports. He shall also present a detailed report of the affairs of the society at its annual meeting. He shall also endeavor to secure reports from the various committees, and from local societies, of the condition and progress of horticulture of the various districts of the state, and report the same to this society. It shall be the duty of the secretary to make an annual report to the governor of the state, of the transactions of the society, according to the provisions of the statutes for state reports.

IV. The treasurer shall keep an account of all moneys belonging to the society, and disburse the same on the written order of the president, countersigned by the secretary, and shall make an annual report of receipts and disbursements, and furnish the secretary with a copy of the same, on or before the first day of the annual meeting. The treasurer elect shall, before entering upon the duties of his office, give good and sufficient bonds for the faithful performance of his duties, subject to the approval of the executive committee.

V. The executive board may, subject to the approval of the society, manage all its affairs, and fill vacancies in the board of officers; three of their number, as designated by the president, shall constitute a finance committee.

VI. It shall be the duty of the finance committee to settle with

the treasurer, and to examine and report upon all bills or claims against the society, which may have been presented and referred to them.

VII. The standing committees of this society shall be as follows: 1st, Committee on Finance, consisting of three members; 2d, Committee on Nomenclature, consisting of three members; 3d, Committee of Observation, as now provided. Said committees to be appointed annually by the executive committee of the society.

J. C. PLUMB, *Chairman.*

Which report was accepted, and the constitution and by-laws were adopted.

The president announced that the time for election of officers having arrived, the society would now proceed to the election of the officers for the ensuing year. The election was made in the usual form, by ballot, and the following persons were chosen:

President. — J. M. Smith, of Green Bay.

Vice President. — C. H. Greenman, of Wauwatosa.

Recording Secretary. — F. W. Case, of Madison.

Corresponding Secretary. — A. L. Hatch, of Ithaca.

Treasurer. — M. Anderson, of Cross Plains.

Superintendent. — D. T. Pilgrim, of West Granville.

Additional members of Executive Committee. — J. S. Stickney, Wauwatosa; A. J. Phillips, West Salem; A. G. Tuttle, Baraboo.

The following persons were elected as Committee of Observation for the respective fruit districts:

1st District, D. T. Pilgrim, of West Granville.
2d " J. C. Plumb, of Milton.
3d " George Hill, of Fond du Lac.
4th " A. L. Hatch, of Ithaca.
5th " E. W. Daniels, of Auroraville.
6th " C. W. Potter, of Mauston.
7th " D. Huntley, of Appleton.
8th " J. H. Felch, of Amherst.
9th " A. J. Phillips, of West Salem.
10th " G. W. Perry, of Superior.
11th " Hiram Smith, of Sheboygan.
12th " J. M. Smith, of Green Bay.

The president appointed as Committee on Nomenclature, J. C. Plumb, B. B. Olds, George P. Peffer.

On motion, the usual appropriation was voted to the secretary.

Mr. Stickney stated that the premium offered by the society for a number of years for the best seedlings had not been productive of very satisfactory results, in part on account of the conditions imposed, being next to impossible to bring samples of fruit for five successive years; in part, on account of inadequate compensation for the labor required, and because the desired qualities were not definitely stated, and he moved that the same premium should be offered for the best seedling apple, said apple to be exhibited for three years; entries to be made annually, and premiums to be paid at the third exhibition; said apple to have *better qualities as a winter apple than any variety now on the recommended list;* which motion prevailed.

Reports were read from the Brown county, Sauk county, Grand Chute, Lemonweir Valley and Janesville Horticultural societies. (Reports given with "proceedings of local societies" in present volume.)

The following resolution was introduced by Mr. Stickney:

Resolved, That in case we receive the appropriation asked for, our executive committee be authorized to appropriate from the same, such sum as they think best, not to exceed one hundred dollars, to promote the interest and usefulness of the summer meeting.

Which resolution was adopted, and the society adjourned to meet in joint convention in the Assembly Chamber at 7:30 P. M.*

Feb. 6, 9:30 P. M.

The society met in the Agricultural Rooms for the transaction of unfinished business.

The committee on revision of the premium list made their report, which was adopted.

* The papers read in joint convention on horticultural subjects, and the discussions following, will be given under the head of "Papers read at Annual Meeting."

On motion, Dr. P. H. Hoy, of Racine; J. Periam, of Chicago, and A. F. Hofer, of McGregor, Iowa, were made annual honorary members of the society.

A resolution was passed requesting Dr. Hoy to act as Entomologist for the society.

In the absence of the secretary, Mr. Geo. J. Kellogg was elected secretary *pro tem.* Adjourned.

Feb. 7, 5:30 P. M.

The society met and the following report was made by the committee on Fruit on Exhibition:

REPORT OF THE COMMITTEE ON FRUIT ON EXHIBITION.

The committee on fruit find on the tables a fine collection of apples by A. J. Phillips, of West Salem, La Crosse county, that show great care in growing and handling, and also the advantage of high limestone ridges for fruit growing. The varieties are Pewaukee, Ben Davis, Wealthy, Willow Twig, Walbridge, Fameuse, Golden Russet, Alexander, Fall Spitzenberg, Ortley, Rawle's Janet, and Jonathan. The last three are seldom grown in that latitude. Mr. Phillips also showed four seedling apples.

J. P. W. Hill, Windsor, Dane county, shows some seedling apples, called Leitch, and Hill's Red Winter, of fine size, excellent quality and very beautiful, which promise well for hardiness.

J. C. Plumb shows six varieties of apples and two of winter Siberians, the General Grant and Lake Winter, the latter of excellent quality.

E. G. Mygatt, of Richmond, Illinois, shows fine specimens of Baldwins grown on top grafted trees; shown to commend top working the tender varieties upon hardy stocks.

M. E. Emerson, Door Creek, shows extra well grown specimens of Ben Davis and Stark.

G. P. Peffer shows a new seedling apple, the Oakland, and five varieties Siberian crabs.

Freeborn & Hatch, Ithaca, Richland county, show enormous sized Golden Russets, and well preserved specimens of grapes, which are supposed to be Rogers No. 3, and Wilder.

Wm. Springer, Fremont, Wis., shows several varieties of the Waupaca county seedling apples of great beauty. Among them we find the Weyauwega, Wrightman and Flora, all very promising.

G. J. Kellogg, Janesville, shows six varieties of apples, Willow, Stark, Tallman, Grimes, Golden Russet and Barrett Russet.

E. W. Daniels, of Waushara county, shows samples of an apple much resembling the R. I. Greening, and which the committee think must be that variety.

C. H. Greenman exhibits a model grape trellis of a new pattern, and sample vines to illustrate its use and his system of pruning.

We find also well preserved samples of Adirondac, Agawam, Eumelan, Wilder, Lindley, but do not find the exhibitor's name in connection with them.

Respectfully submitted,

COMMITTEE.

Report was accepted and adopted.

The committee appointed to specify the condition on which the recommendation of the list of apples for general cultivation was based, were granted further time to complete the specifications.

On motion, an appropriation was made to defray the expenses of Mr. P. M. Gideon, of Minnesota, while in attendance on the convention.

The following resolution was introduced:

"*Resolved*, That Mr. J. C. Plumb be requested to present a report at our next annual meeting, districting the state according to conditions of soil and climate, and giving lists of fruit best adapted to each."

Which was passed.

The arrangements for the summer meeting were discussed, and the opinion was expressed that it was advisable to offer premiums for an exhibition of fruit and flowers, for which the state and local horticultural societies should contribute an equal amount; in accordance with which understanding a resolution was passed, instructing the president and executive committee to complete the arrangements for such meeting.

On motion, the society adjourned *sine die*.

HORTICULTURAL

ADDRESSES, PAPERS AND DISCUSSIONS

BEFORE THE

JOINT CONVENTION,

AT THE

Annual Meeting of the Society, held at Madison, February 4–7, 1879.

SHALL WE CONTINUE TO EXPERIMENT WITH NEW VARIETIES OF STRAWBERRIES?

J. M. SMITH, President State Horticultural Society, Green Bay.

I have been urged to say something on this question, and it has occurred to me that a few words on this subject would not be inappropriate at this time. It is now about twenty years since Wilson's Albany Seedling began to be known among the strawberry growers. Previous to that time, the cultivation of this, the finest of all berries, was confined to comparatively few persons, and the aggregate yearly crop of the country was probably not one-fifth, if it was, indeed, one-tenth, of what it is at present. The varieties then most generally cultivated were Hovey's Seedling, in New England, and the Early Scarlet, or New Jersey Scarlet (which I believe are one and the same), in New Jersey and other places adjoining our large cities. In other portions of the country there were but very few grown, as compared with the present. The introduction of the "Wilson," as it is now termed, was such a vast step in advance of any variety then known, that in the course of a few years it worked a complete revolution in strawberry culture. Thousands upon thousands of those who had previously looked upon this delicious fruit

as only within the reach of the wealthy, or the expert cultivator, now found that they could raise it, not only for themselves but for the market. The firmness and keeping qualities of the berry were such that those at a distance from market found they could carry or send their surplus fruit to the nearest town or city, and often realize sufficient from it to give them quite a little sum of money to use; and at a time of the year too, when the farmer usually has not a large amount coming in.

Thus has this remarkable berry worked its own way, in spite of all opposition, until, it is safe to say, that at least nine-tenths, if not nineteen-twentieths, of all the berries now grown in the United States are of this variety. It yielded when introduced, larger and firmer berries than any of the varieties then in general cultivation. These berries will keep longer and bear transportation better than any other. The vines are as hardy as the best, and prolific to a degree that has not been equaled either before or since.

With all these acknowledged good qualities, it may be asked: "Do we need any other?" I answer, "Yes." With all of its splendid qualities it has some faults. The first ripening fruit is fine and large; soon it begins to grow less, and before the close of the season the berries often become quite small. We need a berry that will hold its size through the bearing season better than this one. Although it is an early berry, we need one a week earlier, if we can get it. We also need one that will continue in bearing longer, and until we get fairly to the raspberry season. With a great many people, there is another and a very serious objection to it; it is too acid. With those who grow their own fruit, I believe that this objection would be nearly done away with, if they would only leave the fruit upon the vines until it is thoroughly ripe. It is not ripe as soon as it turns red, but should remain upon the vines until it has lost its glossy appearance, and is of a deep, dull red. When in this condition it is very much better than if picked as soon as it is well colored. Last summer my family averaged from ten to twelve during the berry season. The table was bountifully supplied with berries while they lasted, at nearly or quite every meal. Upon it were the Wilson, Duncan, No. 30, Kentucky, Downer's Prolific, beside a number of other varieties. Every one was expected to eat as many as he or she chose, and as often as they chose. After the first few days every one, with a single exception, fell back upon

the Wilson as the best for constant use. One lady chose the No. 30 and stood by it until the last box of them was picked. So much for quality; still I am willing to admit that we need a berry of a better and a different quality. How shall we get it? Shall we keep right on buying, haphazard, every new variety that comes along, and happens to be pretty well puffed up by those who are interested in its sale? Are we likely to succeed any better in the future than we have for the last fifteen years?

Suppose we look back for a few moments and see what we have been doing; perhaps I should say what I have been doing; for it is to be hoped that you have not all been as foolish in this direction as I have. Soon after the Wilson became established as the leading berry, new varieties began to make their appearance in great numbers. Each new variety was claimed to be better than any of its predecessors; and its owner would generally close the story of its marvelous value by telling how much better in every respect it was than the Wilson. To name them all, would be to fill pages with names that you would not care to hear or I to read. Sometimes it is one of wondrous size, like the Dr. Nicaise, or Russell's Prolific, either one of which will bear an occasional berry of immense size, but it will generally have the slight failing of being thoroughly ripe and rotten on one side, while it is as thoroughly green and sour upon the other. Perhaps it is the everlasting bearer, found upon the high lands in Mexico, which the peddler brings around, with samples of berries preserved in bottles of alcohol, accompanied by the wondrous story of their constant bearing, from early spring until the snow comes and covers both ground and berries. Here is perfection surely. I hasten to try this new wonder. After years of careful cultivation, upon as good soil as I own, I learn that it will bear an occasional berry during the whole season; and that by keeping, say half an acre of them in the best of order, I might once in a week have a quart of berries, though I think they did not do as well as that with most people. I remember my largest picking, a small tea cup, half full of berries about the size of peas; and then the pleasure that wife and I had in learning that they were scarcely fit to eat.

Another package of plants comes from a gentleman in Ohio, with a request to cultivate with great care; and, also, the injunction never to sell or give away one of the plants, except by his di-

rection. I promise a faithful compliance with all his wishes and try again. After two years I succeed in getting about a single handful of berries of good size, but bad shape, and that taste about like a mixture of rain water and vinegar. I complied with his request, to neither sell nor give them away; and did as I have done with many others both before and since — dug them all out, being very careful not to have one left, and used them for manure; as that was the only way by which I could get even the slightest return from them.

Thus it has been year after year, each new variety resulting in a new disappointment and vexation, to say nothing of the loss of time and money, until a few years since, when I received a lot of plants from the department at Washington. There were two varieties. One was marked "Wilson's Albany Seedling," the other, "No. 2." What that meant, I did not then, nor do I yet know. I was somewhat surprised to learn that our government should go to the expense of growing and distributing a variety that, if not already in use by every grower in the country, could readily be obtained by all, and at a very small expense. Still, as they seemed to be entirely different from my Wilsons, I imagined it was a new variety of them, that would combine all imaginable excellencies, free from the defects that are acknowledged to belong to our ordinary Wilson. They had come just in time. We had just finished setting two or three new varieties that had come from the East, and had a choice spot left where we could, and did set them, with all the care and kindness that we were capable of showing them. About nine-tenths of them returned our kindness by quietly laying down and dying at once. Those that lived were nursed with tenderest care, and in the course of fourteen or fifteen months we gathered our first and last crop of fruit from them. The so called Wilsons, were indeed different from any of the kind that I had ever seen.

They were very small and very hard, knotty, to a degree I have never seen either before or since. In fact, there was scarcely a fairly formed berry upon the vines, and only an occasional one of any kind. I can imagine of only one advantage that they would have possessed over the ordinary Wilson; and that is, if we had shipped any of them (provided, we could have got any to ship), they would undoubtedly have reached their place of destination in

safety, as no express agent or other person would have risked tasting of them more than once; the quality being, if possible, worse than their appearance. The No. 2 bore about as well as the Wilson. The berries being about the size of the common navy bean, and not altogether unlike it in shape. In color, it was about like a half ripe cranberry. In quality, please imagine a cross between the green cranberry and a wild crab apple.

Thus has it been for nearly twenty years, a succession of failures. It may be asked, were they all as complete failures as those named? Not quite; from the Triomphe De Grand, the Jucunda, Seth Boyden's, No. 30, Kentucky, Duncan, and perhaps a few others, I have succeeded in getting some magnificent fruit. I recollect once picking twenty-five berries from some of my Jucunda vines, that made a full quart, and that, too, without looking for the largest ones. Still, if I could have known just how much that quart cost in manure and time, I have no idea that it would have been less than one dollar, and perhaps considerably more than that. The nearest that I have ever come to a success with any of the many new varieties that I have tried, is with the Duncan. But that is too soft to bear transportation, which of course shuts it out, even if it were right in other respects. Next to that I would place the No. 30.

Perhaps I cannot express my estimate of the value of the many new varieties better than in the following way: If some responsible parties should offer me ten cents per quart for all the Wilsons that I could produce, I should not hesitate to fill every acre of land that I possess, with them, just as fast as I could get it ready, and get the plants to put in. On the contrary, if the same parties should offer me fifty cents per quart for all I could raise, and confine me to any two or three varieties that have come out within the last twenty years, I should hesitate long and consider very carefully, before I accepted it, even far enough to make an extensive trial. Understand me, gentlemen; I do not say that some of these varieties are not worthy of trial, or that they should be utterly condemned under all circumstances. I have no doubt but that good fair crops of them have been obtained at times, where the soil, climate and cultivation were all adapted to their peculiar wants. But I am speaking to-day for the millions of our people who love strawberries, but do not have them; and for other millions who

have bought and paid for some one or more worthless varieties, cultivated them for years, and then given up in disgust and despair, saying, "I cannot raise strawberries." I say to you, one and all, that the Wilson is, in reality, the only variety now in general cultivation that you can rely upon with any degree of certainty. With the ordinary cultivator, I do not believe there is one chance in a hundred of his being fairly successful with any other; while with the Wilson, a reasonable degree of success is almost a certainty.

What, then, is to be done? My advice to the amateur everywhere is, to try the Wilson and let all other varieties alone, until some professional grower about you, some one whose business it is to keep himself posted, even if it does cost him time and money, has demonstrated that some other variety will do well with you. I think it is a duty that those of us who are growing berries for market owe to those about us, to warn them against spending either money or time with such varieties as we believe to be worthless. I have practiced this for at least fifteen years past, and have steadily refused to advise any one to set anything but the Wilson, without telling them plainly my belief that they would probable lose both their time and money with anything else. I have sometimes gone further than this. Last summer a man came to Green Bay with a magnificent plate of the Crescent Seedling. The stories that he told about it would almost have put Baron Munchausen at a discount. I wrote a short article for one of our papers warning our people against such stories; told them that I had it on trial, and if it proved to be worthy of cultivation in our portion of the state, I should certainly find it out, and would just as certainly let them know it. I had the plants to sell, and if they really wanted them regardless of their value, I would supply them at a cost not to exceed twelve and a half cents per dozen, while the stranger was asking them $1.50 per dozen. I heard nothing more of him after that, neither have I had any calls for the plants. Right here the question may be asked: will this new candidate for honor that has been brought forward with such a blast of trumpets, also prove a failure? I have not tried it for a sufficient length of time to decide for myself; but I must say that my faith has been much weakened in it within the last six months. I will not condemn it yet, but will say to my friends, do not be in too much

of a hurry to invest in it, for fear it will only add another to the list of your disappointments.

Scarcely a year passes that I do not destroy a number of new varieties, root and branch, being fully as anxious to get rid of the last vestige of them, as I was in the first place to try them. I destroyed three or four new kinds last summer, and have now some half a dozen others that will share the same fate next summer, unless they do better than they have yet done. It may be asked, what do you call doing well, and what would satisfy you in a new variety? In reply, I say that I will not cultivate a berry that yields less than 200 bushels per acre, when it has a fair chance to do well. We surely do not want a variety with fewer good qualities than the Wilson. My view is, that we need something about one week, or if possible, more than that, earlier than the Wilson, and another variety a little later, or one to continue in bearing until we get fairly into the raspberry season.

If any person will send me one dozen plants each, of such varieties, possessing all the good qualities of the Wilson, in the same degree as the Wilson, even if they are no better in any other respect except being earlier and later, I will cheerfully bind myself to pay $100 for the two dozen plants, after they have proved a success, by a thorough and systematic trial upon my grounds. But, gentlemen, until I see at least reasonable evidence of some improvement over the Wilson, I propose hereafter to go a little slower on new varieties than I have done heretofore. To say that I have spent hundreds of dollars, in time and money, upon new varieties, is to speak very far within the actual truth; and when I say, that with all the care and attention that I could bestow upon them, I have never made one dollar from them, this is also the truth. Upon the other hand, I have been very successful with the Wilson from the first to the present, and that almost without an exception. This being the case, I have no hesitation in saying to the beginner and to the amateur cultivator, take the Wilson and treat it well, and you will almost certainly reap a good reward for your labor. But touch the new varieties as a burned child touches fire, very carefully, until some expert or professional grower in your vicinity has demonstrated that it is at least not entirely worthless.

STRAWBERRIES.— Geo. J. Kellogg — I would like to ask Mr. Smith if he ever raised the Green Prolific by the quantity?

Mr. Smith — No, sir, I never did. I got disgusted with them before I tried them myself. A friend of mine tried them, and made so thorough a failure that I would not risk them. He had tried them under good circumstances; everything, as I thought, favorable.

Mr. Kellogg — Perhaps he set them by themselves. It is a pistillate, and, like any pistillate variety, entirely worthless when set by itself. The Crescent Seedling may not be hermaphrodite enough to produce the best effect by itself, but it certainly is enough so to produce a good heavy crop. The Green Prolific is one of the old varieties, and has been tried generally and thoroughly, and with success, for a near market. It is not good for transportation two hundred miles. On one of the rows, three feet wide and eighteen rods long, my record was fifty-six quarts to the picking.

Mr. Smith — I had one picking of Wilsons last summer over the whole ground, in which we averaged twenty-eight quarts to the square rod.

Mr. Kellogg — How many pickings had you for the season?

Mr. Smith — I had five large pickings.

Mr. Kellogg — My average, for the plantation, was ten pickings.

Mr. Smith — I only count five; I only count the large pickings.

Mr. Kellogg — I averaged the full crop, and it amounted to just the picking of this day, which would make five bushels to the square rod of Green Prolific. The Wilson did better with me. One row two feet wide and sixteen rods long gave forty quarts to a picking, and averaged ten such pickings, which would make between six and seven bushels to the square rod. I admit that the Wilson is worth more than anything else we have ever had for general culture; yet the Crescent Seedling, with me, last year yielded, well; on plants that I moved half a mile, I picked berries four and one-half inches in circumference, and the stems were loaded right down to the ground on plants set the same spring. In the bed I left for fruiting, where I did not disturb the plants, there was a splendid show. I do not know what it is going to do. I can tell you by the first of July next.

Mr. Plumb, of Milton — I want to talk a little on President Smith's experience. There is something he did not tell us that we would like to know. The soil in which he grows these berries is a purely artificial soil. It is one of those Fox river sand banks that

are supposed to be worthless, and yet it did grow big pine trees originally; that is, before the sand covered up stumps and all. But he composts his manures; he fills that land as completely full of decomposing manure as it is possible to fill it. The soil is simply a vehicle for certain purposes of his; he puts in everything. Now you see what the conditions are. It is hot-bed culture, essentially. He must have a variety like the Wilson, that has tremendous native vigor to stand it, to begin with. Others will fail for various reasons. They have not the constitution to stand that kind of treatment. In the next place, if he produces some of these large growing, soft varieties, they are so large and so soft that they will fairly rot on his ground, and they are worthless there. Now change the conditions; give him an ordinary farmer's soil, we will say a good stiff clay bank, a good potato or corn soil, such as farmers generally grow their berries on, and he will find the conditions vary exceedingly. He will find that the Wilson still stands ahead; no doubt of that; but there are some of these other varieties, that with him are practically worthless, that will then occupy a very important position; the Green Prolific, for instance, will yield more to the acre or square rod; will continue in fruit longer and will bring more in the market, provided you get it to market in good condition.

Mr. Smith — But you cannot do it.

Mr. Plumb — The growers at our place ship to Madison, 32 miles, without any trouble.

Mr. Smith — But I have got to ship 200 miles.

Mr. Plumb — That is another thing. There is a good deal about this strawberry question. I procured my first plants of the Crescent Seedling last spring from O. B. Galusha. I planted them two feet apart in the row, the rows four feet apart. If I had put them, as he said, ten feet apart each way, they would have covered the ground, and done it handsomely, such is their native vigor. They are just about as bright and full leaved to-day, under the straw that covers them, as they were the first day of September. They promise to hold that foliage, which will almost insure them a crop next spring; and I must say that I never had plants bear as they did. I picked the fruit buds off from most of them, but a few that were left bore fully equal to Wilsons that had stood a year. The berries were not as large, but the plants bore as much in pro-

portion to their size as the Wilson, that had stood a year. I might speak of other varieties, but I wanted to speak of the condition of the soil. The Arena, which we have almost discarded, is on some kinds of soil a good berry, but on a sandy soil it is a complete failure. These conditions we cannot overlook.

Mr. A. G. Tuttle, of Baraboo — I have had some experience with the Crescent Seedling. I planted it a year ago, and for vigor and hardiness I have seen nothing on the list of strawberries which I think compares with it. Plants that were entirely uncovered last winter, were as bright and green in the spring as they were in the fall, while the Wilsons were worse destroyed last spring than I ever knew them. I fruited the Crescent last spring, and could not see but what it bore as heavy a crop as the Wilson. Of course I had but few plants. The most of the plants I transplanted. They were standing only a short distance from the Wilson, and I noticed, after a frost had occurred, the blossoms that were open upon the Wilson, after a careful examination, seemed to be about nine-tenths of them destroyed; while on these only about one-tenth; the frost had an entirely different effect upon the blossoms. The plant is very vigorous, and I think my friend Smith has not had a very good chance to try the Crescent Seedling if he set his plants last spring. I saw the original bed of Crescent Seedling after it had been fruited three years. The man who originated the berry, Mr. Parmalee, is not in the fruit business. He propagated it for his own amusement and not for sale, and never has sent out a plant to my knowledge. The grower, Mr. H. H. Smith, who lives not far from Mr. Parmalee, took up the plant, I think he told me, in 1871 or 1872. When I was there, Mr. Parmalee told me that he had a new seedling strawberry that he thought very much of. He had fruited it one season, and if it proved to be what it promised, he thought it was going to be ahead of anything in the strawberry line. He said Mr. H. H. Smith had taken and fruited it also, and he, too, thought very much of it, and was growing it and sending it out. I do not think Mr. Parmalee has ever sent out any plants at all.

The reason he called my attention to the bed was, that as I was reading in his house the description Mr. Smith gave of the plant, that it would keep down all the grass and weeds, so that after the first year there would be no care required, and that it would go on and fruit year after year; I told Mr. Parmalee I thought that was

a pretty large story; if we had the plants out west, I thought the weeds would get the advantage of them, but he said, "go into my garden and look at my bed." I went and saw the bed which had been fruited three years. He had a bed of the Arena growing on one side and of the Wilson on the other. He said, "we treat those exactly alike. They have not had a bit of labor upon them since the first year." The Crescent Seedling was entirely free from weeds. I could not see one there, large or small; and it was a perfect mat of vines. He said it had borne as well that season as it did the first. He could see no real difference. I am satisfied that it will take possession of the ground, and that no weeds and grass will grow if you keep them down the first year. I set a quantity of them last year, four feet apart each way; they have covered the ground so there will be a solid mass of vines in the spring; and for hardiness and productiveness and for quality, I have never seen a berry I thought superior to it. Of course it takes years of trial to test these new things, and I think friend Smith should give it a further trial before he condemns it. I appreciate the Wilson. It is a valuable berry and has proved so. It has been the great berry, as the Concord has been the great grape of the country. It has its faults, and I hope that we shall get something that will be equal in productiveness to the Wilson, better in quality, more uniform in size, and on the whole a better market berry. That is what we are looking after in new varieties; and though I would not give up the Wilson, I would still try varieties that are promising.

Mr. Smith — I did not run down the Crescent Seedling. I said distinctly that I had not tried it long enough to be certain of what it would prove to be. The idea I wanted to convey was simply this: for the amateur, those who are growing strawberries for their own table, not to try these until such men as Mr. Plumb and Mr. Kellogg and myself, whose business it is to test new varieties, and stand the loss if they prove to be failures, have tried them. It is no matter if we do lose, because it is a part of our business to test them. Let the amateur watch such experiments and see if the results are good, and not plunge into them, fooling away time and money. I do not know but the Crescent Seedling will prove to be all that its friends say for it, only I say to the amateur, "go slow," for I certainly have not as much faith in it as I had a year ago. I set my vines last spring and they did well. I got them from Mr.

Galusha. As to keeping down the weeds, if the grower will manure the ground as he ought to, and the Crescent Seedling or any other strawberry will grow thick enough, strong enough and rank enough to keep down all the weeds, they will grow so rank that he will have no berries.

Mr. Tuttle — It seems, from trial, that they do produce large quantities of berries. That has been the case on Mr. H. H. Smith's grounds. His Crescent Seedlings have been fruited for five years. He says he has not spent a dollar on that ground since the first year, and he gets very large crops. These berries will not keep the weeds down the first year, but the second year they grow a foot high, the foliage perfectly covering the ground, and you might as well try to grow weeds under a board as under that thick foliage.

Mr. J. W. Stone, of Fort Atkinson — I have been engaged in growing strawberries for quite a number of years and I used to put the Wilson ahead. One time I had four acres of Wilsons; no others of any account. I tested several varieties, but relied on the Wilson for the main crop. I find I can do better with other varieties now. I stated here, a year or two ago, that the leaf-roller destroyed the Wilson more than any other variety. I am entirely free from that now; the leaf-roller drove me to test other varieties. I have the Col. Cheney on my grounds, and can grow more quarts to the acre of it for market, than I can of the Wilson. And I have tested them this year by raising them side by side. My Wilsons did not yield as many quarts, and the first Wilson berries that were picked were not as good an average size as the last of the Col. Cheneys. I am not particularly interested in the Col Cheney, any more than in any other. I have now about half and half of Wilson and Col. Cheney; my main crop of Col. Cheney looked bright all through the year. My Wilsons, though there were no insects on them, rusted and were not as thrifty. I think strawberry growers, those that are going to make a business of it, had better look for a hardier plant than the Wilson. I think we have them among those now on trial.

Mr. Kellogg — In relation to the Col. Cheney, it is good for nothing unless grown with some other variety.

Mr. Stone — I set every third row with Wilson. The way I set them now is, one row of Wilsons and three rows of Col. Cheney, and there is no trouble in fertilizing them thoroughly.

Mr. B. F. Adams, Madison — I grow, at the present time, four acres of strawberries; three acres of Wilsons, and one of other sorts, Jucunda, Col. Cheney, Charles Downing, and Downer's Prolific. Our main crop, is, of course, the Wilson. We grow fruit for market. We sell it here in this local market, and ship it to many other points. We derive the most profit from the acre of mixed varieties; not that they yield a larger quantity than the Wilson, but the fruit averages so much larger and finer, and is so much more attractive in market, that it sells for a higher price; last season, when fruit was very low, it sold for nearly double. I think there are many localities in this state, and all over the country, where these varieties which I have spoken of, on this acre, can be grown with success, and some of them be made to yield as high as our friend Smith desires, two hundred bushels to the acre. I do not know that the Jucunda can be made to yield that quantity on a clay soil, on these white oak ridges, but it certainly can be made to yield as high as one hundred. I have myself grown them at that rate in that location, which is only a short distance from this city, on a white oak ridge, half a mile from the lake, but it is a variety that is much better than the Wilson to ship; it is firmer, and it goes into the market bearing a much more attractive appearance.

Mr. Wood — My hopes are at present largely fixed on this Crescent Seedling. I have heard it recommended so highly, and I have so often failed in raising strawberries, because I failed to give them the labor and attention that they required, that I have been looking for just this strawberry, that would give something for nothing; and I am sorry to have anything said in this convention that shall dampen my hopes in the least, because I have procured some of friend Kellogg and planted them, and I am going to cultivate them next year; and if I ever have to touch them again, I am going back on friend Kellogg.

Mr. Q. J. Freeborn — I have raised strawberries for the last ten years, and must say, I do not like to hear my old friend, the Green Prolific, abused. Until I heard of the Crescent Seedling, I thought that was the berry for a lazy man, but I guess I'll have to try the Crescent Seedling. The Green Prolific with us will not stand a particle of manure. In a virgin, sandy soil, it will produce a large crop; we do not think it necessary to set them with the Wilson; we have set them without, and had good crops, invariably.

HUMBUGS.

BY GEORGE J. KELLOGG, JANESVILLE.

There are but two classes now living, the humbugged and the humbugger. Presume they are both here. Let man, woman or child who is not humbug, stand up. Go to Washington; the greater the position, the greater the strife; the higher the prize, the more trickery, chicanery, deception, fraud, avarice, imposition and all the evils of high life, culminating in debauchery, bankruptcy and ruin.

What of humbugs in the legal profession? There was a time when the laws were so simple there was no need of lawyers. Now, while congress is composed of more than three-fourths of this fraternity, what wonder that the laws are so ambiguous that even a Philadelphia expert cannot get beyond the amendment to the amendment. Did you ever know a lawyer that was not a humbug, or who would not for money clear the very dirtiest, low-lived scamp?

Are there any clerical humbugs? The question seems to be one of fleeces instead of sheep, and not much care of the lambs except that the fleeces be kept good. Are we getting so far advanced that we are losing all the old landmarks? Is there not humbug in our colleges, in our city schools, and less common sense in our district school teachers than years ago? In the graded school, we find the scholars must march to music, step to time and go barefoot; and if by accident a pencil is dropped, it cannot be picked up until school is out, no matter if the child is idle the balance of the day. One of our city patrons told me that all the scholars learn in the high school is to walk up one aisle and down the other without kicking his fellow. Is this not humbug?

Did you ever know a doctor that was a humbug, or rather did you ever know one who was not? When called, will he not shake his head and look wondrous wise; make the case a very critical one; he was not called any too soon; doubtful; he would need to see the patient again before he slept, and between the nostrums he left and the disease, no wonder the patient is worse and will doubtless remain about so if the doctor can control the case, especially if the bill is good. Have you ever known his reputation built up by a good deal of brass and two good horses, with a furious drive

into the country twice a day, returning on a different road? Poor timber is now worked up into doctors at very short notice.

How about the agriculturist? I suppose this big word means the humbug farmer of now-a-days; humbug in his house, in his barn; he doubtless had a humbug carpenter — there is hardly any other; humbug in his surroundings; humbug in his seed and in his soil; humbug in his way of farming; humbug in his horses — he is the one who sent the boy for the doctor, and he went afoot to gain time; humbug in his cows — who ever heard of a yearling heifer whose milk was so rich that a pint would make a pound of butter; humbug in his hogs — see that sandy pair that cost one hundred dollars; humbug in his sheep — wool pulled over his eyes at the last fair to the tune of several hundred dollars; will he pan out by humbugging some one else? Fifty dollars for a trio of fowls; how is that for eggs at ten cents a dozen? Did you get rich with the hulless oats and the beardless barley? Have you tried the new corn, one kernel in the hill; the potatoes that are bug proof, or that new kind just from Peru? Have you tried the Jerusalem artichoke, and did your pigs dig their own dinner and make pork for one cent per pound? Did you ever give an order and note for an unlimited supply of lightning rods, and how did you get out? How about that new kind of reaper that stands beside the fence yonder, or that patent churn, up in the garret, or the new dasher that brings butter in five minutes? Lastly, did you ever get acquainted with a patent right man and make your pile, over the left?

Turn to any calling, business or profession, and it is polished up with brass; sham and shoddy, the best side out; if there is any defect, it is puttied up, varnished and whitewashed, from the wafer to the wooden nutmeg; from the Bank of England to the sand bank; from the highest social circle to the lowest dregs of humanity; humbug in everything; humbug in man, but oh! oh! what shall I say of woman? — worse and worse.

Where is humbug more often seen and more seriously felt than in horticulture? You plant a tree with the hope of eating choice fruit some five years hence; you nurse it to life, pet it, lo! these many years, and what? It blooms and blights, or worse, what it bears is a humbug. It is easy to tell where you bought that tree. A smooth-tongued man called on you, familiary addressing you by name, showed his pictures and glass jars with magnified fruit; a

certificate from some reliable firm either east or west; promised to be around next year and replace any failures; he won your good opinion, and although you had been caught before, and had firmly resolved you would never give another order, yet he talked so fair, and represented a firm that you knew; he had also sold to many of your neighbors, and showed their orders; and lastly he had the recommendation of the president of your Horticultural Society, and you thought you had a sure thing, and as you wanted some of the new Russian apples, you ordered ten at one dollar each; and as you had had poor luck with cherries, he persuaded you to try the "Utah Hybrid;" it was just the one to bear every year, loaded down with fruit in clusters like grapes; it seemed a wonder it had not been discovered before; you would try a few. As you had always failed in raising pears and he had a new stock on "the French root," on which pears would not blight, Eureka! now you thought was the time to go in on pears. The Alaska crab, he said was something wonderful, and so you thought as you saw it through glass, and although one dollar a tree was high, if they were bearing size, you could soon make that up in fruit. A few winter crabs, so nice in the spring; a "tree rose," a "strawberry tree," a half dozen "blue roses." As grapes were your favorite fruit, but on account of extra cares or labor you had not given them the proper attention at the right time, and had failed; and as he had the grape that needed no protection, and would load down with fruit even if not pruned, and so many prominent nurserymen of Wisconsin had recommended it, you took a dozen; they were to be bearing size and you were to pay a good price; and then there was that white grape, you had heard so much about and had never been able to find it, "as hardy as the Clinton, as great a bearer as the Concord, and the fruit would keep all winter;" a dozen of them would not be too many. Now a look at his jars convinced you that if such gooseberries, currants, plums and strawberries can be raised, and here is the proof, why, you will take some of the gooseberries that will not mildew; currants that the currant worm will not eat; some of the plums the curculio will let alone; and if strawberries as big as apples can be grown like that, why, set me down for one hundred, not even asking the price; such a chance you might not have again. Now you are through; but wife wants a few roses, shrubs, bulbs, shade trees and evergreens, and the order is finished and signed; too much in

a hurry to carry out and add it up, but you have only ordered what you want, and as the trees are not to come till fall, it does not matter.

Fall comes; one cold spell, no trees yet, but here comes a notice; you go to town; find a man delivering a lot of trees and bundles, all about in the wind and sun. This is not the man you bought of, but he shows you your orders all footed up now, and it scares you; the bundle is so small marked for you that you refuse to take it, but you now take a memorandum of the order and talk it over with your wife; she thinks that all those things were talked of, and after consulting a lawyer, you conclude to take the bundle. It has not improved any by lying two days in the wind and sun. After you get home and compare the bill and bundle, you find the Russian trees all look just alike, although they have ten different names on them; the Alaska crabs are just little riding whips, "bearing size" truly! and they look like a kind that you have already; the "Utah cherries," about one foot high, and the "French pears," they too must be dwarfs, only two feet high; the tree rose and strawberry tree, wonderful, just six inches high; the blue roses look as though they always would be blue, and the grapes, "bearing size," about the size of a knitting needle, "need no protection!" I guess they will not only need protection now, but a good deal of nursing; and the plums, why the curculio could never find them; but here comes a little wad marked "strawberries, one hundred," what a little bundle for twenty-five dollars. Who ever heard of strawberberries at twenty-five dollars per hundred. They must be the hen's egg kind! "Shade trees," four feet high; what a shadow! "Evergreens," one foot; how they will break the wind next winter! Well, the bundle is sorted and the trees must be set out. As you cut the roots they look as if they had been frosted, but it is too late to cry for spilt milk; the trees are set, a portion of the bundle is put in the cellar to dry up, and the result will be, what few things live will bear anything but what they are marked; the strawberries are a little sour berry, the Russians are all some worthless apple; Alaska crab, alas! alas! the tree looks like Briar's Sweet.

This is but a faint description of what is transacted every day throughout the country. The unknown, irresponsible tree tramp will persuade you he is working for such a firm, and will buy up worthless stock any where he can find it cheapest; fill the orders;

the labels and orders will correspond, no matter what the trash filled in; the most experienced cannot always tell what the stock is, and by the time you can prove anything, where is your tree tramp? Occasionally, one gets locked up for forging orders. Pity they all did not. Instances have come to my knowledge where June roses worth one shilling have been sold in Madison for $2.50 each; where one hundred Plumb's Cider apple trees were substituted with three kinds and not a Cider; where Alaska crabs were sold for one dollar apiece and Briar's Sweet, without labels were substituted. The last sell I have seen on new "early Russian," is a plate of Red Astrachan. Not a bad sell, if they would put in good trees at a shilling, and have them marked, and the true Red Astrachan. Four of our best stand-bys are Russian, viz: Tetofski, Red Astrachan, Duchess of Oldenburg, and Alexander; but what about the nine hundred and eighty-eight varieties from Russia, disseminated by the department at Washington. Who is the man or men who will ever sift out the wheat from that pile of chaff? Let a monument be raised to his memory. I have received just thirty-two kinds of the nine hundred and eighty-eight, and after ten years careful investigation, even if they come to bearing, what will I know about their adaptation to different soils, hardiness, productiveness and quality? And where is our Russian school? Take, for instance, two names of the thirty-two just received, No. 430, Arkad Krugli Woskowoi; No. 458, Scholti Nalin.

Who is going to be humbugged now? Nine hundred and eighty-eight chances on new Russians, and these are not yet in the hands of the itinerant tree peddlers. A few have already been so far tested in hardiness of tree, that we have hope of success, but their is not a man in our state who can tell the quality of five of these kinds. How often have we been deceived with our own new varieties after they have been tested for five years before receiving the prize, and then only proving valuable in a few locations.

What have we been able to accomplish in the past twenty years? Turn to the Horticultural Report for 1876, page thirty; eighteen reports from as many different men and portions of the state, giving the lists of the most profitable ten varieties in the order of value, numbered from one to ten. They all have the Fameuse in their lists, eight of them as the first for profit. Fifteen have Duchess, but only five put it as No. 1 for profit. Twelve have Golden Rus-

set, but only one puts it at the head of the list. Eleven have Talman Sweet; nine have Red Astrachan. Of the forty-one varieties named to make the list of ten, sixteen get only one vote each. The best resolution this society ever passed, was the one recommending every man to look about him and select those varieties that are successful on soil and exposure like his own. I know of a practical horticulturist who, after years of trial, has settled down on Duchess, Fameuse and Early Rose potatoes for apples; no pears, no plums, no cherries. Hislop and Transcendent for crabs. He wisely trusts the potato to supply all failures in the trees.

In reading up the report for Maine, I am much amused to learn that the tree peddler has been selling them "Pewaukee, Haas and Walbridge as new Russians," the scions directly imported. As they have had ten to twenty years experience with apple on crab roots, they unite in pronouncing them a humbug; "dwarfing the tree and dying at an early age." The leading swindlers claim that the reason trees grown on crab roots cost so much, is because they pay three dollars per bushel for the wild crab seed.

Perhaps some of you would like to invest in a new thing; the pie plant, hybridized with the peach, giving to the pie plant the peach flavor; roots one dollar and fifty cents, and warranted, replaced at half price. Another sharp agent will find out where your best trees came from, and then he is furnishing from that very place. There is no end to their ways, tricks, and the new and wonderful fruits and plants they have just imported.

Take the pear humbug; in just one place in Wisconsin, I believe pear trees have paid first cost. Outside the influence of Lake Michigan, I know of but one tree as a success, and before that tree dies, I want its history to be put on record, so that if the poor thing dies, its good works may stand a monument forever. That tree is a Flemish Beauty, planted in the town of Spring Valley, Rock county, Wisconsin, by Rev. D. Alcott, in 1857; commenced bearing in 1866; has borne pears by the bushel for six years, and in less quantity for four years more; sold at two dollars and twenty-five cents to seven dollars per bushel. Amount sold, fifty dollars and thirty cents. In 1871, it furnished for market, five bushels. This is besides what have been used and eaten by the family and admiring friends. It is needless to add that it stands in clay soil and has not been highly cultivated.

Take the plum humbug; put your finger on a kind that is reliable. Where are the friends of the Hinkley? and oh! where is the "Wild Goose?"

It is a good thing to plant cherries; for one year in three you may get enough to make the birds happy; if you sell any, or attempt to can any, you are liable to the penalty of the law for "Cruelty to Birds."

While currants can be bought annually at one dollar per bushel, they will pay the consumers, but I would rather contract to furnish fifty bushels of raspberries or strawberries at the same price than currants.

In the small fruits you are liable to humbug yourself. You buy a choice kind and give it extra care; its success will lead you into error, for as soon as you put it along side of the old sorts, and give it like care, it fails. Of the ten thousand new varieties that have originated in the last twenty years, what strawberry can equal the Wilson? There are many who are claiming the position for some favorite, but take the fact that the Wilson has never been planted, or cared for, but it has paid, on all soils and every location, and with all kinds of treatment; and it has fruited at the rate of five bushels to the square rod, yielding twenty-five quarts to a single picking to the square rod. This was done last summer on a bed bearing its third crop, after the severe frost and without irrigation. As I am a humbug (that is what my wife says), my foreman is ready to testify to these facts; but as you may still think there is some humbug about it, I will state that J. F. Morse and I. L. Jenks, years ago on a strife, produced, the first, five bushels on a square rod, and the last, four bushels and a half. The new varieties that have come to the front in the last five years promise to beat the Wilson, some in quantity, many in size and quality. The Great American has produced the past season a strawberry measuring fourteen and one-half inches in circumference, and on the originator's ground, one hand picked twenty-two quarts of this variety in twenty minutes; but it is is not doing anything like as well as this elsewhere. It needs high culture, clay soil, in hills. Of the comparative merits of thirty varieties, I can tell you by the fourth of July next, as I have over half a million plants in nice condition for fruit. In raspberries there is about the same field for humbug as in strawberries. I would not advise any one to invest over a hundred dollars a year in new fruit.

If you want practical experience in any department of horticulture, go to the man who combines practice, theory, common sense and honesty. Be very cautious when you approach a nurseryman. Believe one half of what you see, one-third what you hear, one-fourth that comes second handed, and nothing you cannot trace to an authentic source. These nurserymen are a set of humbugs. One of the best ones I know of in the state acknowledges this, and wants me to write him up "aisy." If I were to order anything of him, I should examine and see if it was not black-hearted, root-frozen, blighted, stunted, grafted on crab stock, full of the eggs of the canker worm, bark bursted, and frozen to death. All things being right, I should then probably set it out in a poor place, give it no mulch, never hoe it, and then lay all the blame on this poor nurseryman.

After all, there is a humbug bump in the Yankee's make up, and he rather likes it. You offer him something risky and the more so the better he bites; he wants a chance to beat his neighbors, beat himself, beat the world and all the rest of mankind. If he don't beat, he likes everybody to believe he does, even if he is a humbug. Every man has his hobby, and carried too far this becomes a humbug, no matter whether it is crabs or cranberries, grapes or goslings, pigs or pickles, fairs or fizzles, men or monkeys, mules or donkeys. I suggest that this joint convention, before it adjourns, do appoint, for each assembly district throughout the state, a "Fool Killer."

Mr. A. F. Hofer, of Iowa — The gentleman mentions one humbug in the high school of Janesville; he said they went so far as to make the children go barefoot. I do not consider that a humbug at all. I believe it would be a great deal better for many of them, if their fathers would keep them at home and let them go barefoot on their farms, so they would learn to earn a living in an honest way instead of studying humbug, and humbugging their neighbors afterwards. If they would go barefoot on the farm, it would develop the feet, so when any humbug came on the farm they could give him a good send-off.

Mr. Plumb — We would all like to talk on this point, but our Horticultural Society had a brief discussion on this subject, and put their views in the form of a resolution, which I will read, as expressing the Horticultural Society's sentiments on this subject.

"*Resolved*, That all nurserymen who send out agents, should in all cases expect to be fully and strictly responsible for all the representations, and to fully meet all the contracts made by such agents.

"Second, that tree-planters should, as a means of self-protection, demand of all who may solicit their orders for trees, unquestionable proof that they are the authorized agents of some reliable nurseryman, and that such nurseryman will hold himself strictly responsible for all the representations of such agent.

"Third, that tree-planters may reasonably look for all things that are really valuable in this climate, in the leading nurseries of the country, rather than in the hands of irresponsible traveling canvassers, and that it may be taken as *prima facie* evidence of fraud, when scarcity or extraordinary qualities or excellence is claimed for them, or when for the same cause exorbitant prices are asked for their products.

"Fourth, that newspapers throughout the west would protect their readers from swindlers, and advance the cause of horticulture, by publishing these resolutions."

Mr. A. J. Phillips—I do not think we ought to pass this humbug paper without discussion. There has been a great deal of deception practiced throughout the country on farmers and others in regard to selling fancy stock at fancy prices. I think we ought to go slow in disputing what Mr. Kellogg says on horticulture, because he speaks whereof *he* knows. I have talked with a nurseryman recently who is spending a great deal of time, and I think in the end is going to work out a great thing for the west, in experimenting with Russian apples. Perhaps it will never pay him, but he is enthusiastic. Anything that has "Russian" to it, he is enthusiastic about. He is enthusiastic about Russian turnips, and if there were Russian potatoes he would buy them. He tells me, in Russia, where men go long distances in the winter on sledges, there are places put up where travelers can stop to warm; if they do not, their eyes will freeze up. In places it is so cold that if you pour water on the ground it will freeze before it gets there; and the apples and pears that are going to be introduced in this country, are from this cold climate. They have varieties with buds resembling a hickory bud, very large, and encased in a number of layers. You must all look out for such things.

Speaking of substitution, I think there is a great deal of harm done in that way. I was speaking with a gentleman a short time ago; I think it was in reference to selling the Alaska crab, which has had a great run through this country. He said when they filled his order they substituted Astrachan and Briar Sweet for it. I told him I did not think there was any nurseryman that had the cheek to do that. "Yes," he said, "there's a man in Janesville by the name of Kellogg that did it.

Mr. Field — There have been a great many ideas suggested by this paper of Mr. Kellogg's, and he gives us a great deal on that subject every year, but I want to ask Mr. Kellogg and this convention if it does not do us good sometimes to be humbugged; if it does not sharpen us in business transactions. If a man can come on to my farm and humbug me, and do it handsomely, I like to have him do it. He cannot do it the second time. It makes me sharper. It makes me more suspicious of these very individuals. It sets me to thinking. I say to myself, "If another man comes along, as one did last summer, and says, 'Have you been troubled with these tree peddlers?' 'No, sir, I have not.' 'Has not one called on you?' 'Yes, there has been a dozen here, but I do not allow them to trouble me. I am glad to see you all; I am glad to talk with you, and I think I know what I want. If you have got what I want now, I will buy it of you; if you have not, I won't. I think I know what I want." But there is too much of this humbug in the world. Go into a store in Madison, or anywhere else, and ask for a certain thing, and if the keeper has not got it, it is ten chances to one if the clerk does not say to you, "My dear sir, we have not got that, but we have got something that will suit you better." I went into a store the other day where they said so to me. I said, "I know what I want a great deal better than you do; if you have got that, show it to me, and if you have not, say so." Of course he said he had not got it. Now we who live in the country, and have no opportunity of buying what we want except of these men you call tramps, ought to know what we want. If we do not, it is all right to get bit once in a while. It will make us sharper.

I do not blame Mr. Plumb or Mr. Kellogg, or anybody else, for going out and selling what they have got, if they do it fairly and honestly, and do not bring around their fruits in jars that magnify forty or fifty times, like the jar with Judge Bryant's gold-fish in,

in the other room. If you go on one side you think it is a whale, but on this side it is a little fish about an inch long. Everybody ought to know, if they open the jars, it would be impossible to be deceived. I knew one man who asked if he might open the jar. "Oh, no, it would spoil the fruit." "Well," he said, "by ——, I will open it," and he took his jack-knife and knocked the top right off, and there it was, a common kind of fruit magnified two, or three, or four times. We want to know what we want, and when it comes, buy it.

Mr. Kellogg — It is a good thing for brother nurserymen to pitch into each other, but this remark of Mr. Phillips, I do not know where he got it. I never had an order for an Alaska crab except from a man in Illinois, and I never saw one except in the tree journals; never sent out a tree labeled that, and never furnished another in its place, except to this man from Illinois, who took some Briar Sweet when he could not find the Alaska crab, and put it into the bill without any label. He took the trees from my nursery, and paid me about ten cents a tree, and *he* filled his bill out without my knowing anything about the orders.

BLIGHT.

By B. F. ADAMS, Madison.

It is perhaps unwise to write on a subject I do not fully understand, but this task is cheerfully undertaken, with a hope that the members of this society may have some texts to explain, and theories to verify or explode in relation to blight. These are not original with me, being mainly a compilation of theories as to its cause, and remedies prescribed by those who claim to have more or less thoroughly investigated the subject. The writers are numerous; the theories of the cause various, and the remedies legion. In ransacking some twenty volumes of horticultural and agricultural periodicals, covering as many years, I have not noted all who have written on this subject, but have discovered that they are widely scattered over our country, and uniformly agree only on one or two points, principally that blight is very destructive to fruit trees, especially the pear. The prime causes are asserted to be atmospheric

influences, drouth, wet soil, parasitic fungi, diseased roots, insect work, zymotic fungus, rich soil, contagion propagated from diseased quince trees, electrical action, freezing of unripe wood, mechanical action, etc. After learning that so many causes produced blight, I was somewhat discouraged. As late as 1875, a writer who signs himself W. B. Smith, boldly asserted that "it is a disease we know nothing about. Twenty-five years ago there were many who knew a great deal about it, but they have all disappeared." Many who do not pretend to know the cause of blight, prescribe remedies for it. These sum up pretty heavily from all sources, and number as follows: Starve the trees, slit the bark, cut off blackened limbs and burn them, salt the roots, use lime and sulphur wash, whitewash the trees, dig trenches around them every three or four years, three feet deep, cutting off the outer roots, and then throw the earth back into the trenches (big job for a lazy man); prune the tops severely, use turpentine and lamp black, apply linseed oil to the trunks and limbs, scatter lime and ashes under the trees, scrape off the dead bark and apply caustic soda, bore a hole with a two-inch auger, fill it with salt and sulphur and put in a plug. This last remedy was recommended with the strongest assurance by somebody, but I never have tried it, believing that the two-inch auger remedy, to say the least, might injure small trees, nothwithstanding the virtues of sulphur for destroying fungus. It is always cheering in emergencies to have one man appear who knows just what to do, like him who told old Sparrowgrass, when the latter's horse broke through the ice into a mill pond, that he knew exactly what to do to get the horse out of that misery, and when bidden to do it, deliberately took his gun and shot the animal.

In consulting authorities on blight, it is proper to mention the most learned and intelligent. The American Pomological Society in 1871 appointed a committee to study this subject, collect information and report two years thereafter. In their report they mention several kinds of blight: first, that caused by sterility, easily remedied by fertilizing; second, "blight caused by zymotic fungus, whose presence is not detected until life is destroyed in the affected parts." This is the kind I had in mind when I commenced to write this article. Thinking that this report must unravel the mystery of blight, judge of my surprise when this able committee announced that they had arrived at no satisfactory conclusion as to

the peculiarity of soil and temperature that induce the favorable conditions for the development of this fungus vegetation. Two years ago, in company with a New Jersey fruit grower, I visited some pear orchards in central New York that were perishing from blight. He remarked, as he viewed the dying trees, "an insect is the prime cause of all this destruction." In response to my request to show me how the work is performed, he took a sharp knife and shaved off the bark from the discolored spots, and pointed out a minute hole, well defined, extending through the bark and into the wood, apparently made by a worm. We found this in most of the spots examined, but the depredator we did not find. Our friend observed, in conclusion: "notwithstanding what all our horticultural writers and philosophers say on this subject to the contrary, it is certainly the work of an insect that ravages in one place for a while, destroying pear trees especially, and disappears, only to reappear in other localities. Hence, the pest only comes at intervals, and rather lengthy intervals, in some instances; but is much more destructive within a brief space of time than those that injure our apple orchards." He declared that "Downing's Fruit and Fruit Trees of America" contained all that had yet been discovered on the subject of blight. The trees we examined were mostly Flemish Beauty and Bartlett. One Seckel pear tree, loaded with fruit, stood uninjured among one hundred trees of other varieties, all alike growing in sod ground. I inquired of my friend why that was left; he replied that the bark and wood were tougher than the other kinds, but it was not certain that it would remain uninjured, as no variety of pear trees was exempt from attack.

In this connection let me quote a brief statement, taken from *The Germantown Telegraph* of 1878: "S. F. Folsom states that himself, a neighbor, and Prof. T. B. Lovett, of Attica Collegiate Institute, with magnifying glasses have brought to light one unmistakable cause of deadly blight in pear trees. The tree is poisoned by an insect that bores through the bark from one-fourth to one-half inch into the wood, a hole about the size of a small pin hole; as the sap arises and descends it poisons and discolors the wood. Remedy: slitting the bark each side and through it with a knife."

In examining some forty or fifty articles on blight, in search of information, I found this remarkable statement made by Mr. Engle, of Van Buren county, Mich.: "I planted, fifteen years ago, one

thousand pear trees, 975 of which now look like the abomination of desolation; cause, blight. Twenty-five have fully met my expectations, and these were planted not far away from the others, but in a peach orchard, and are all healthy, save one Flemish Beauty slightly blighted two years ago." What influence these peach trees have had in preventing blight, is a greater mystery to me than blight itself. Mr. Engle has no theory, but thinks perhaps they absorb some element from the soil hurtful to pear trees. He has faith enough to plant one hundred and fifty more in his peach orchard. The peach tree remedy will not be tried extensively in Wisconsin, as it would certainly bring up the cost of raising pears to the Kellogg standard. Believing that pears can be grown in this state, if we can protect the trees from this great scourge, or arrest its progress when it appears, I hope that this society will work with others in investigating the cause or causes, that produce it, and also in testing such remedies as seem adapted to cure the disease. It is not more common nor destructive now at the west, than in other parts of the country celebrated for fruit growing. The localities I visited two years ago had been exempt from blight. How long pear trees have been grown there, I cannot state, as the general settlement of the region dates back seventy years or more. Nearly twenty years ago I planted a few dwarf trees, Flemish Beauty and Bartlett, on high prairie land; they grew and flourished for a while, bore fruit three times after having passed the winter of 1864; but the blight came and they perished. I tried to doctor them by cutting off dead limbs and burning them, applied salt and ashes to the earth over the roots, but only one appeared to make spasmodic efforts to live for a year or two longer, then died. These trees were in sod ground, which some claim is the proper condition to exempt pear trees from blight. This theory has been disproved by the testimony of many others who have tried it. I bought some fresh stock of standards, after my first setting had all perished, and planted them; but the blight killed these the same season they were planted. Some very unbelieving and uncharitable people say that those who write and talk about raising fruit, seldom grow but little themselves. Unwilling to admit that this statement is generally true, I nevertheless confess that it hits my case in raising pears.

It is noticeable that the remedies prescribed for blighted trees

are identical in several instances, whether the theory of cause be insects or other influences of an atmospheric character, soil, or both combined. This appears rational enough, because it is possible that wash applications and slitting the bark may be obnoxious or destructive to the insects as well as renovating to the trees. Concurrent testimony, gathered from widely scattered localities, does certainly establish the fact of the usefulness of sulphur and lime wash, as directed by the superintendent of the botanical gardens at Washington. This may be prepared with "a half bushel of lime and six pounds of sulphur, and cold water enough to keep it in a semi-fluid state; apply to the body and limbs two or three times during a season." Slitting the bark is regarded by many as very beneficial, but not enough positive testimony yet appears to warrant it as an infallible remedy to check blight. Linseed oil applications are extensively commended, and strong caustic soda wash is declared by those who have witnessed its effects to be the most efficient remedy yet applied to check it and renovate the trees smitten with it. Until we know more than we now do of this subject, we can take our choice of remedies and use them as the best known at present. In conclusion, it is proper for me to say of my researches, that the weight of evidence recorded favors the zymotic fungus theory of blight, viz: certain conditions of the atmosphere or soil, perhaps both combined cause a disease. Soon after the fermenting sap begins circulating the discolored spots on the limbs and bodies appear. It is a very plausible theory in this climate, but not so clear in many other parts of the country, where it is confidently asserted no such conditions of the soil and atmosphere exist. In localities where, until recently, fruit growers have raised pears for forty years undisturbed, they desire to know why the "peculiar conditions" had not engendered the disease before. It is the easiest way out of the mysteries of blight to call it insect work and quit; but to verify this theory, it is necessary to specify what form of animal life does the work, and not only hunt their holes, but capture the little rascals and learn their methods of operating. Where is the state entomologist? Horticulturists are generally sanguine and enthusiastic people, even under discouragement; but a sense of helplessness comes over some of us as we contemplate the destruction we have witnessed by this scourge. In brief periods the labor and care of years has been made profit-

less, and in spite of our best efforts we expect these periodical visitations will come and destroy more or less of our trees. We may theorize, conjecture and experiment, but do not feel absolutely certain that we shall save them from blight, unless we make some wonderful discovery of preventive means, equal in magnitude to that which a Dane county farmer hoped might result from an examination by Prof. Daniells of the track of the great tornado of the 23d of May last. The farmer was viewing the fallen timber, twisted, broken, splintered, piled pell-mell, and scattered promiscuously about the farm, and while this examination was progressing, remarked to a neighbor that "it was a big job to stop the disturbance after a tornado once got fairly under way, and he hoped that the scientific men of the country would club together, investigate the whole subject thoroughly, and devise some means to prevent tornadoes from *starting*."

J. C. Plumb, of Milton — I am glad that our friend Adams has had the courage independently to take up this question and ventilate it. I think it is well to keep it before the people. Some of you will remember that several years ago I read a paper here on this subject, which you will find in the volume of transactions for 1872. It was the result of many years' careful reading and correspondence on this subject, corresponding with nearly all the leading horticulturists in relation to it. I found at that time such an utter want of harmony of opinion in relation to this question, that I was utterly at a loss how to compile those opinions, as our friend Adams has been. He has compiled the best thoughts he could get, perhaps. Well, I did not let up on that subject. If you remember my position, I took the ground then, after examination, that it was a disease of the circulation purely.

The prevailing theories were: first, insects; second, fungoid disease, the result of the development of myriads of cryptogamia. I made up my mind that neither of these theories were tenable. The advocates themselves acknowledged that they were not well founded. I saw a letter from Doctor Taylor, our national cryptogamist, which he wrote sometime last summer, bearing directly on this subject. His opinion was asked if he could trace blight to a cryptogamous or a fungoid origin, and his reply was, that he had hoped to reach that point or something that was definite in

that direction; but after all his examination for years, he was unable to account for blight on that theory in a satisfactory manner. Those of you who have read the last report from our Washington Agricultural Department will find that Dr. Taylor says nothing about it there; but the National Chemist has a short article bearing on that. He has investigated the subject and holds the same opinion: that the most careful examination does not show that it can or may have a fungoid origin. These are not exactly his words, but that is his position; and he finally says that investigations are in progress which will be carried out, and he hopes to bring out something more definite in another year. There is the same controversy in relation to the fungoid origin of certain diseases in animals. The advocates of the fungoid origin of disease, both in animals and vegetables, are losing ground; they are gradually giving this thing up. I feel very confident that, within five years, the very position which — I say it without egotism — I assumed in 1872, will be clearly demonstrated to be the true one. That it is a disease resulting from an unequal circulation, an improper diet of the tree and want of proper assimilation. You may call it a sort of vegetable dyspepsia, disturbing, destroying the normal relation between the circulation and assimilation in the tree; and the result is, there is injury, whatever it may be, disturbance of the circulation, resulting in diseased sap, dead wood. Whenever we see this, we call it blight.

Mr. Gideon, of Minnesota — I have lost hundreds of fine trees with the blight. I find that the blight seldom strikes the same tree twice in the same season, and does not often strike the same tree more than once. Trees that are struck badly one year are seldom hurt the next, unless you cut off the blighted part. If you go and cut off the part immediately after it blights, I find that it is very apt to blight again; and when the blight strikes an orchard once, however badly, it is not often that it strikes any portion of that orchard again during the same year. That is the case at least with my orchard. I have had blight in it every year for some six or seven years, to a greater or less extent.

The first season it struck the trees on about three-quarters of an acre, which had been highly manured and well cultivated. The trees were growing very rapidly, but outside of this three-quarters of an acre, there was not a tree on the premises blighted, although there

were thousands all around it. It killed the main portion of the trees on that three-quarters of an acre; this was the first blight that made its appearance. I went to work and cut off all the blight. It struck in again immediately, and did greater damage than before. The next season I let it work its own way mostly, but it took another plat of ground that just cornered with that, of about the same size. It too had been highly cultivated before planting, and the trees were tolerably small and all of one variety. The other plat contained probably fifty or more varieties, of which scarcely a tree escaped the first season, and very few the second season. In neither of those years did it return back to the same ground.

Adjoining was ground that had been in grass for several years; the two first years no blight appeared on the grassy part of the orchard; the third year the blight was there, and not on the cultivated portion. Then I had another orchard, where the ground had never been plowed; the trees were on raw land, and were surrounded by timber; the blight struck in there at a furious rate and hurt them badly. I had another orchard, separated entirely from the others, where the wind blew from one lake to another; it lay just between the largest lobes of the lake, in an open space. On that the blight kept away until the fourth or fifth year, but there it came finally. There had been no manure there at all; the ground was in cultivation until the trees began to blight, and some is in cultivation yet; there they blighted as badly as they did on any portion of the farm. Sometimes the blight would attack some of the trees, and you would only see it on the leaves; or it would attack the fruit, and the trees and the leaves remain sound. In other places the poisonous matter would strike on the body of the trees in places as large as my hand; then again it would girdle them evenly around, and after girdling, some would run down into the ground and leave the top of the tree growing; in others it would leave the bottom unharmed and run up to the top; in others it would run both up and down. A year ago last summer the greatest mischief was done. The wind was coming from the west, and passing diagonally across this orchard that stood between the lakes, struck in my dooryard. The space where it entered the dooryard was some thirty or forty feet wide, but the position of the trees was such that the current of air was concentrated, and nearly burned

up every tree it came in contact with. It looked as though a fire had been through there, it attacked plum trees, apple trees, European mountain ash and native ash, and then struck for a space of about four feet where it had to pass through between thick rows of what some term service or June berry, and burned the leaves on each side. Some of the branches were about killed or entirely so; then it had from six to eight hundred yards to go, in order to get to the orchard. As it went on, it never touched a tree outside of a strip of about ten feet wide; just went on, taking everything in its way, showing to my mind very conclusively that it was an air current. All the phenomena that are found anywhere were present in my orchard; some trees were burned, some were blotched, and others girdled in all forms. Other orchards I have seen blighted in a similar way. As for varieties, I had four trees of one variety standing where the blight had been all around them, and not a leaf of them had I ever discovered hurt when the blight was on the premises before, but this year they were injured. They stood in the corner of the orchard, and there was blight not more than thirty or forty feet away in the corner of another orchard, back of them. Finally, an air current appears to have run through between the corners of the two orchards, and striking the trees in the corner of each orchard, pretty much entirely ruined those four trees that had stood so long unharmed. As to its being insects, I do not think it could have been possible, or, if it is, those insects float with air currents.

For my part, I believe it to be a disease nearly akin to cholera, and as hard to fight. Certainly you can apply no remedy that you can depend upon more than you can for the cholera. Here is a tree that may be attacked one season and never touched again, with blight all around it. Another tree that has escaped may be blighted another season, and the former one be left untouched. The blight is first known to have visited America about thirty years ago; at least it is just about thirty years ago that I saw the first signs of it. It ran a few years, but did little damage to anything but pear trees; showed a little on the apples. It was followed by the cholera, and it is a remarkable fact that the blight came from Asia, according to the history we have of it. It is a disease that starts out from Asia; so does the cholera. It passed away when the cholera passed away; at least very few symptoms of it were left. The second time the blight came out of Asia and passed over Europe, it

was followed by the cholera. We have the blight now upon us for the third time; in its passage over Europe, it attacked pear orchards in France, Germany and Switzerland, that were as much as a hundred and sixty years old, so much greater was its ruin than ever before; and when it reached America, we find that the same excessive ruin is attending it here. It is my opinion that it is nothing more than a sign of a bad time for the cholera, and that that disease will follow it. Cholera has started again in India, where it started before, and it will probably march over the world the same as it has previously done.

Mr. Kellogg — I want to call attention to the fact that our friend Peffer has been down among the blighted countries east, and he may have a word to say. I don't think it is worth while to spend much time on this question, for the more we hear the less we seem to know about it, and I think the time of this convention is not being well taken up to follow this subject much further.

Mr. G. P. Peffer — I attended the convention at Baltimore a year ago last fall, and most all of the discussion was on this subject of fire blight. It was voted twice to discontinue it, but every once in a while the same discussion would break out again, and finally it got so far that the officers went to fighting about it, and they decided to divide the house upon the question of the continuance of the discussion; and so it was settled that Mr. Taylor, I think it is (or some one who is in with Mr. Saunders), should make a final decision, if he can decide, which is right. Some contended that its source was insects; some that it was fungoid, and some that it was atmospheric; and we could not come to any conclusion; so it was finally left to him, but I have not seen anything of his report or decision. The pear trees were affected down there as badly or worse than they were with us, and in the botanical gardens I did not see one but that was affected with fire blight. As to the remedy of lime and sulphur which they use, I did not see that it did a particle of good. They were affected the same where it was applied as where it was not.

Mr. Plumb — The department chemist, William McMurtrie, I see by the last report, accepts the proposition that mildew — fungoid growths — can injuriously affect plants of the higher order on which they exist, only when they are in a debilitated condition. That is the latest authenticated theory we have from headquarters;

this is the decision of the United States chemist; you will find it in the report for 1877.

Mr. Hofer, of Iowa—I have watched this disease for years, and I do not know that I am any wiser now than I was ten or fifteen years ago; that it is no insect I am pretty sure. I was after that bug or worm, or whatever you call it, for six years, and I never could find any signs of it. I have one tree in my garden that is never affected with the disease, while almost all the rest of the apple trees suffered nearly every year; and lately I noticed that this tree stands near a chimney where all the year round the smoke goes over it. I don't know whether having the tree smoked is of any consequence or not, still that tree is never affected, while the other trees are. It has been my opinion for two years that the hot rays of the sun striking the tree produce a kind of a sunstroke in hot summer days. Blight generally comes after a very hot day; a little rain follows, and the next day the blight is there. I believe it is the hot rays of the sun which scald the tree through the bark. That is my opinion. What to do for it I don't know.

HOW TO RAISE GRAPES.

A. F. HOFER, McGREGOR, IOWA.

At the suggestion of Mr. Plumb, of Milton, I came here to tell you what I know about grape raising. First, I will have to tell you that I am no nurseryman. I do not raise grapes to sell or drink. I raise them and eat them. I have a little vineyard in Iowa, and last summer when I was editing a paper, I published some articles on grape growing. The articles took so well all over the state that I was induced to compile them into a book, and Mr. Plumb got hold of one of those little books, and he wrote to me to come over. I wrote back to him that I would come over and demonstrate to him and to all of you something that many of you do not know about grape raising. I was born and raised in the vineyard in Germany. From my sixth to my twenty-sixth year I worked in it, twenty years, and I believe it is the only business that I understand from the bottom up. Here in this country, they told me at first that our way in Germany would not work. I waited a good while before I

tried it, and then I found it is the same here as it is there. The grape vine is just like a man; you have got to educate it, train it and keep it in bounds, or you cannot do anything with it; so I did with the grape vines here as I did in Germany, and with good success.

I raise my grapes on a single pole. They may be trained on trellises or in any shape. In this climate we have a great advantage; they grow without care, and many men in this country are raising wild grapes on tame vines, and call themselves grape raisers, and teach others how; but they grow only wild grapes and they stay sour; but I am in favor of raising a quality of grapes which we can eat and enjoy and have them sweet and good. I raise them on the single pole system. I have brought one along to demonstrate to you. This spur or bow bore grapes last summer. I have two or three such bows on a pole. One goes this way (indicating), bending in a circle, and tying back to the base of the cane; this one is a little further up; by this process the grapes are brought out in the sun and air. Then the same year I can raise on such a cane from twenty to thirty large bunches of any kind of grapes. A sprout like that (indicating) will generally have three bunches, but I take one off, so that I may have two better bunches than the three would be. Two bunches are enough. They grow more solid and condensed, and two bunches are as good or better than three; still sometimes I let the three remain. The first or second leaf beyond the last bunch of grapes I pinch off, and allow nothing to grow but two canes, which I will bow down next year again. The great secret in raising grapes is this: what you raise next year you must prepare for this year. If you follow that rule you can raise grapes anywhere. We have another advantage here. We know that we have got to bury our grape vines, and they never freeze in the winter time if we bury them; lay them down and put some soil or rubbish or tomato vines, or leaves or a little straw over them, and it will protect them against any cold in winter; but if you leave them out, ten degrees below zero will kill any grape vine, when they are in a wet condition. If they are real dry they may stand fifteen, but not any more; therefore we lay them down every year.

When we lay out a vineyard we plant them about eight feet apart, but after the vineyard is done we have them about four feet apart. We plant eight feet apart because we want to make roots.

We never have one vine standing on its own roots long; we just let it grow as long as it will grow up large enough, and then we make two or three of it. In Germany my father and I had over three hundred poles on one root which extended fourteen or sixteen inches under the ground, a regular network of roots; all one kind of grapes. If you have the roots right the fruit will never drop off; it will hang on and stand; while if you plant a grape vine just like a tree and let it stand on its own roots, in six, eight, or ten years it will get old and have poor grapes, even if you prune it. I prefer the single pole system because they are more convenient and I can prune them all around, while on trellises they are all on one side; and if you want to go on the other side you have to walk clear around it, while on a pole you can work on the vine just as you could on a hill of corn. Another advantage of this bow system is that you bring your grapes down to the ground. The sweetest grape grows nearest the soil; if the grapes were raised high in the air it would make the pole top heavy, while if they are down within two feet of the ground the pole has not much to carry.

In multiplying grape vines I dig a hole fourteen inches deep and four feet square around the vine. I cut off the top shoots with a knife, and lay the whole cane down in the bottom of the ditch and bring it up in four places, so that I have four bearing vines; but you must be careful not to meddle with the main root; that is to be preserved; if you break it off you have to begin anew; but if you let it stand, the vine will grow right on and bear grapes the same year. Then instead of one vine bearing grapes, you have four out of the one, which will bring you grapes the same year, and this is the main secret of the success of grape raising. You want young vines; the vines are all right for a crop three years after, and you have to keep them young. When my vines get old, parched and thick again, I just dig another hole fourteen inches deep and draw the whole thing down and make more roots and new vines. That making roots is the main secret, the main part of raising grapes with success. Now there is great diversity about pruning. They say I prune too much. If you let a lateral grow six or eight inches, the fruit bud will diminish and become impotent, or bring very small fruit, while if you take the sucker away you raise a full sized bud. I tried that for twenty years in Europe and do here the same way. Many raise grapes here — they grow for them — raise some

sour things, and think they can raise grapes, and will not be taught. They are just like musicians; every fiddler thinks his own fiddle is the best, and so with grape raisers; still I do as I did in Germany, and as long as I raise good grapes I don't care whether pruning hurts them or not. The testimony I have for my system is my vineyard; when people come there in the fall and see my grapes they are generally astonished. My vineyard is at McGregor. I have about two hundred and fifty poles. It is on the bluff, on the southwest slope. I prefer that place because sometimes you have a frost in May or June when the grapes have sprouted some ways, and if you have them on the east side towards the rising sun they will surely die, because the sun's rays will kill them after being frosted. If you have a southwest slope, the sun will warm them gradually and the frost will not hurt them. I have had good grapes on my place, while others lost them all by the sudden outburst of the sun warming them too quick. It is just like a half-frozen man; if you put him into a warm room immediately, he will die sure, while if you rub him with snow he may recover. It is the same thing with a grape vine. Last summer I raised about half a crop, when others lost about all they had because they had them on the southeast slope. The sun killed them all; still about half of mine were killed also, but they froze so hard it is a wonder that I saved any of them. In this climate we can raise grapes as well as in California, and it is a paying business. If I would sell mine, I could raise half a dollar's worth on every pole, selling them at four or five cents a pound; still I do not raise any more than I need myself, though sometimes I sell some. I always sell some on the first of September to show them all that I am ahead of them anyhow, and keep ahead of them. Another thing, we want to raise grapes here which ripen early; grapes which become ripe on the first, or not later than the tenth or the middle of September. As soon as grapes get soft or colored, frost will not hurt them; but as long as they are green, frost will shrink them up.

We have another great fault in this country. Many people think that as soon as grapes are black, or blue, or pink, they are ripe; but they are greatly mistaken in that. They are only changing color then to get ripe, and a Concord ought to hang four weeks before it is really good, and if you let it hang five it will be better. The Hartford is the only grape which is sweet as soon as it is colored;

still it is not as profitable a grape as the Concord. Then I have a seedling grape which I believe will be the grape for this country. I have three poles bearing, and about twenty-one yearling roots and about fifty more started. I intend to make them the grape for this country. They are about as big as an ordinary plum; they are ripe on the first of September, and splendid. I had them in our horticultural society at McGregor, last fall, and everybody was astonished. These were the second crop; the frost killed the first fruit buds, but they sprouted again, and brought another crop a little later.

There is another thing; a great many farmers in America lay great stress on trimming the vines in the fall because they bleed so much if left until spring. If you hear a man talking about grape vines bleeding, you set him down as a man that don't know much about it, because it won't hurt them a bit. I trim in the spring or fall whenever I have time, and I often make the spurs or bows and tie them up with willows at once. You can do this easier on a wet day. After a rain I can make about fifteen hundred in a day. (Mr. Hofer here illustrated his manner of cutting and tying by means of a vine.) I sometimes put two bows above and two below, and then raise one or two such canes again for the coming year. I raise as many new canes as I have bearing ones, or one more, to use for making new vines, and I have two or three spurs or bows on one pole. I prune to about ten buds; beyond that I let everything grow; about two feet above the grapes; the middle of August I take a sickle and cut them off on top; you have to leave them an outlet up there; it is not necessary to prune any further; if you did, it would spoil the fruit bud for next season. All suckers should be rubbed off as soon as they grow; that won't hurt at all, but if you leave them on, so that they form wood, then it hurts the cane; the bud is so small it will not be injured by rubbing off the suckers, if done at first. I do not believe that bleeding is hurtful. You will not hear it from an established grape grower. If you hear a grape grower talk "bleeding," set him down as an ignoramus. I carry the canes up higher each year, until in four or five years I get pretty near to the middle of the pole; three or four feet high; then I dig a hole again, fourteen inches deep, and down goes the old wood and all, and then I make new roots again. When I lay them down I cover immediately. I can make four new vines if I need them, or just renew

the one by burying the old parched wood and bringing the vine right around in the old place, and bring it up with four or five buds above ground, and raise a crop the same year. I do not take up the original root. I have twelve vines on one network of roots; they all work together and hang together; this getting strong roots is the main part of raising grapes; it prevents the fruit from falling from the stems. The roots are fourteen inches from the surface of the ground; I never have any difficulty from their sprouting up.

Mr. Kellogg — After ten years will not these roots be in your way?

Mr. Hofer — No. After ten years, if you dig down and cut one in two, it would not hurt it one bit. There is so much hanging together under the ground that you cannot hurt them any; besides, this is the remedy for the dropping off of grapes. Neither the Muscatine nor the Hartford drop with me. I plant the vines eight feet apart at first, and in two years cover the ground with vines four feet apart; then if I want to extend I can go four feet further every year. Last summer I went to West Union to stop with a friend of mine, and he had four old Concord vines on trellises. Some of them were as thick as my arm, and they did not bear anything, and he asked me what to do with them. I showed him how to lay them down, and he laid one down and made seven young vines. He afterwards took the rest of them down and made twenty-five new vines, and he raised more grapes last summer than he ever did in his whole life. A great many are following my plan and are well satisfied.

The grape does not need much cultivation. I hoe in the spring and then keep the grass down; it can be plowed; all you want is the grass down; grass makes the grapes rot. I do not mulch the ground; I manure in August. You can keep the grass down with long straw as well as with a hoe. Grape raising is a business which ought to be learned and understood by our people, because it is the best fruit we can raise, and it is the best paying business we know of. It is not half as much work as they think it is, if a man understands it; but it is a business, and a man must know how; you must know how to tie them down. I can make fifteen hundred in a day with pleasure. It is a pleasure to work in a vineyard. I never saw a man that would not like it. If I hoe, I hire somebody; there is not much pleasure in that.

The grapes growing near the soil will ripen first. That is one advantage of this bow system, to bring them down. They keep warm on a southwest slope. The evening sun goes down on them, and it makes the ground hot there, and it will stay hot, and warm them in the night. When the grape vines are blossoming, the old saying in Germany is, that the vineyard man ought to sleep in the vineyard without a coat. It wants warm, hot weather, and ninety degrees is about right. With that temperature, three days from the first blossoming you will see little grapes.

Mr. Field — What time would you tie them down?

Mr. Hofer — Just as soon as a warm rain comes in March or April; tie them back to a foot from the ground, and they will hang around just like a wreath. The pole is to support the prospective canes, to tie them to, and protect them against the storm. If any of you come to McGregor next fall, come to my vineyard, in August, or even in June, or any time next summer, when they begin to grow, and I can show you more than I can tell you here. People come ten and twenty miles, and just stop in the hotel, and walk up to my little vineyard to look at it.

Mr. Plumb — Would you cut your vines when they are in bloom?

Mr. Hofer — It is not good for them; they are so tender then, and you would disturb the bees. The honey bee is a great lover of the grape vine, and we Germans believe it is necessary that the bee should fly from one vine to another. I don't know whether there is anything in it or not, but we do not work in it there, and it is not well to do so; you shake the poles or disturb them, and in blossoming time we keep out; we think it pays better. It is only three days; if they blossom longer than three days it is not well for them. There is one thing I did not speak of yet. We have only two causes by which we should lose our crop, and these are, first, by the May or June frost after they have sprouted, and, second, by having wet, cold weather during blossoming time. If they begin to blossom, and a cold, sleeting rain comes and lasts two or three days, it is very apt to diminish the crop; still it does not do so here as much as it does in Germany. They are really more easily raised here, and with less trouble, than in Germany.

Mr. Periam — I would like to say a few words in relation to this question, for the reason that I have been something of a grape grower myself. There is one special point of improvement that Mr.

Hofer has mentioned here, and that is in the renewal of the cane. The renewal system is correct, but the difficulty under the old practice is, that we cannot carry it out to suit us. Mr. Hofer's plan carries it out perfectly, and I must confess that, although I have read Mr. Hofer's book very carefully, I never understood anything about his system until I heard him explain it here. There is another point in connection with Hofer's system, and that is this: it is very certain that under the pole system of cultivation, by having your vineyard so you can go through it both ways, you can keep it clean for about one-third of the cost you can with the trellis system; it is also easier to manage. It has been the plan I have followed all my life, with this modification, that I use but a single cane, and twist or twine it around the pole, and instead of renewing, I keep raising my crops on short spurs as long as I can, and then at last I have been obliged to pursue the same plan that Mr. Hofer here speaks of, laying down the vine and covering it up, and starting again. But my general plan has been, if I can get three crops of grapes and then get a crop killed by the frost, I am perfectly satisfied to lose that one for the sake of renewing my vines.

I think Mr. Hofer is in error though, and I presume I will be borne out by the experience of grape growers, of whom there are plenty in the room. There is no doubt in my mind that cutting in the spring, before the new wood starts, is injurious to the grapes very often, especially the Concord. It was particularly so with the old Isabella of thirty years ago, which has been now superseded by better sorts. My plan is to cover the vine in the fall, and then take the cover off in the spring as early as possible, and trim them off, and leave only just as much wood as is wanted. I then leave them on the ground until they show signs of sprouting. I see a great deal in this system that Mr. Hofer has so carefully elaborated, and for my part, I shall pursue it, because it recommends itself to me as being not only better, but much cheaper than the way that we have hitherto practised. If we can do away with our trellises, that saves a great deal in grape culture; and if we can raise grapes by any simple system, every farmer in the country will sooner or later come to have a good sized vineyard; and I never saw a farmer yet who began to plant a vineyard and took care of it well, and had success one or two years in raising grapes, but had vineyard enough about him to satisfy a good big family of children. They

will eat tons of them if you let them alone. I never saw a person that could be cloyed with grapes that some of these high-caste agriculturists east say are not fit to be eaten. I never saw a man cloyed with the Concord grape.

Mr. Hofer — It is a good plan to let them lay on the ground as long as they don't sprout, and you can do that if you don't spur or bow them; but if you want to do this, you have to do it before the buds grow. I don't see much benefit in winding them around the pole; you bring them too high, so that the grapes grow too high in the air. I raise them all within two feet of the ground. It is not material if you believe that bleeding will hurt them. You believe it does. I do not. If you cut yours in the fall, you are just as well off as I am. I cut mine in the fall, too, because I do not need as much covering to protect them from the cold of winter. As soon as the new growth starts they cease bleeding. It all goes into the new sprout. They only bleed until they sprout, but if you leave the cutting until the new growth commences, you hurt the new sprouts. After they begin to grow once, they must be protected on the pole and tied on.

Mr. Plumb — I have prepared a synopsis, at Mr. Hofer's suggestion, which will perhaps answer a good many questions, and condense the the thing.

He prefers the southwest slope, because there is the most dew, there is the warmest air, and the least frost. He prefers a red clay soil, with gravel or rocky soil mixed in.

Plant early sorts in fall or early spring.

Strong roots and canes are necessary to success.

Dropping is from want of root power.

He would have single poles and annual renewal; cutting or pruning the annual in fall or spring.

Bleeding does not injure them.

The first year let one or two canes grow from the ground, to be carried up the pole. Keep off all laterals and rub off all suckers, as they appear.

The second or third year, spur or bow the last year's canes for fruiting, and allow the first two buds to grow for renewal as before, carrying them up the pole without laterals. Allow no laterals, and but one leaf on the fruiting cane at each bud, until past the fruit; keep down all suckers, as before, and allow no shoot to grow that is not needed for present fruiting or renewal.

About the 15th of August, cut back ends of strong growth with the sickle.

Prune early and promptly, but do not touch the vines when in bloom.

Poles are not renewed until they become so weak that they will not be able to resist storms; white oak will stand three years.

Let one or two leaves stand beyond the last fruit bunch, before you pinch off the bearing cane.

Do not neglect to protect them during winter.

Mr. Hofer — I want to explain one thing more. In my system, I have not a leaf or a stick on the pole which does not belong to it. I do not raise any canes but those I shall need for another crop, and the one which bears the grapes; and in my system, if you understand it once, if there is a leaf or a lateral which does not belong to the vine, when you are walking past it, rub it off, and you can count every bunch of grapes. If somebody steals a bunch of grapes from my vineyard, I can see where it was.

Prof. Daniells — Would you not rub off the leaves from the other side of the cluster?

Mr. Hofer — No. That leaf on the other side of the cluster should stand; the grape needs that; if you break that, it would be just as if somebody took half of your lung out. I let one or two stand beyond the last bunch, but no laterals. These leaves are necessary there, but if you let that lateral stand here, and leave nothing here but a blossom to grow, and take the leaf off on the other side, that grape never would amount to anything; you don't want to grow any brush — you just raise canes to grow grapes on, and the extension goes into the canes that are growing up for next year, and makes them strong.

Mr. Plumb — I have no doubt that some of us, if we had time, would like to pick Mr. Hofer pretty thoroughly. I know there are some that would just like to get at him. I invited him here because I thought he could do us some good. He is a gentleman I am wholly unacquainted with. I never saw him before, but I have had some correspondence with him; but there is a pattern of a trellis here which our friend Greenman has worked up; I have no doubt but that when he presents his paper he will elaborate his own system, and perhaps ventilate this some, so I want you to withhold your judgment until you have heard the rest.

Mr. Hofer — I told you on the start, there are certain rules and principles which should be observed in raising grapes, whether you raise them on trellises or on bows. If you do not observe them, you can raise poor grapes, but you cannot raise as good a quality of fruit as I can on the single pole system. Grapes want the sun and the air.

Mr. Plumb — We shall dissent from you in regard to the temperature which buds will endure. Two years ago, our grapes on the trellis went through from twenty-five to thirty degrees below zero, repeatedly, and I have shown a great many people grape vines that stood on the trellis on the top of the hill, all through that low temperature, open to all the inclemencies of the weather.

Mr. Hofer — This (referring to the vine used in illustrating) went through twenty-six degrees, and I will cut it; when they are winter-killed, there is a little black spot in the middle; if it is green, it is good (Mr. Hofer then cut the vine). It is green; it would have grown. That is a kind that would stand any degree of cold; if it were a Hartford or a Muscatine, you would find it black; it depends a good deal on how the wood is; a strong cane can stand more cold than a weak one. If any of you want my book on grape-growing, you can write to me, and I will send it to you at any time.

CONDITIONS OF HARDINESS.

J. C. PLUMB, MILTON.

"Hardiness" is a relative term, based upon local conditions of soil, elevation, aspect, moisture, heat and cold, as well as the general quality of vital force in the tree. Therefore we can never judge correctly of the hardiness of a variety without knowing all these local conditions; and the aim of this paper is to point out, in a simple way, the apparent conditions which go to make up the essential quality of "hardiness." To illustrate, Downing says of the Grimes' Golden Pippin, that it is esteemed for its hardiness in its native state; and Judge Knapp says of the banana and orange, that they are eminently hardy with him in Florida; but we do not take it for granted that we can grow either the apple named or the orange in our state with success. And so we must have a new stand-

ard of hardiness, as our climate and soil differs from that east of the Great Lakes in the same latitude. It is these new conditions of climate and soil that drive us to the most rigid test of all new sorts that come up for trial.

The conditions affecting the hardiness of a tree may be arranged under four distinct general divisions, namely:

1. *Organic.* Structural, including variety, etc.
2. *Geological* soil formations.
3. *Climatic.* Temperature and saturation or moisture.
4. *Location* and *culture*, including pruning and general care.

That woody growths differ in their organic structure, is a matter of common observation; but to show the relation between such differences and capacity for enduring climatic changes, has been too generally overlooked by scientific observers. Two years ago I spoke of this subject before this society in these words: "Woody structure is made up of vegetable fibre, which holds the sap in various stages of development toward organized matter. This vegetable fibre contracts with cold, while the sap expands with any degree of cold sufficient to congeal it (pure water expands below 39 deg. F.). This contraction and expansion is a severe strain upon the cellular structure of a tree, and a rupture of its cells produces some form of disease. Now, the capacity of a tree or plant for enduring repeated extremes of temperature, or in common terms, hardiness, is measured by its toughness or strength of fibre, and the size of its sap vessels. Thus the section of Rhode Island Greening shows a much larger proportion of porous wood than the native crab, and equal sized sections of each variety, dry, will show a difference of twenty per cent. in weight in favor of the crab wood. The same will hold good with all wood growth of a given species and climate. There will be a corresponding difference in their capacity to resist the changes of temperature as indicated in this test, allowing something for the operation of the vital force in all cases."

The question of "vital force" is one on which science is at variance. Some claim that there is no inherent vitality in living objects, but that organized matter is built up and lives by a general law of growth or matter in motion. Whatever may be the true theory of life or action in organized matter, we know that while individuals differ largely in their native vigor and endurance,

the variety or species show much greater variation in this respect. I am more than ever convinced that we may measure the enduring powers of a given species by the rule given above: *The size of its capillary cells and the toughness of its fibre.*

Water in open space congeals at 32 deg., but in fine capillary tubes it has been lowered to 4 deg. below zero, without solidification. The condensed juices of a tree properly ripened for winter are rich in mineral elements, and do not congeal at even a much lower temperature; the exact point we do not know, but approximately at 5 to 10 deg. lower than pure water in similar circumstances. So we find: first, that the *smaller the cells* and the more *condensed the sap* in them, the less strain upon the woody structure or the cell walls; and second, that the more woody the fibre and the tougher it is, the less the liability to be injured by the extreme changes of winter.

M. DeCandolle gives the following as the law of temperature with respect to its influence upon vegetation:

"1. All other things being equal, the power of each plant, and of each part of a plant, to resist extremes of temperature, is in the inverse ratio of the quality of water they contain.

"2. The power of plants to resist extremes of temperature is directly in proportion to the viscidity of their fluids.

"3. The power of plants to resist cold is in the reverse ratio of the rapidity with which their fluids circulate.

"4. The liability of the fluids contained in plants to freeze, is greater in proportion to the size of the cells.

"5. The power of plants to resist extremes of temperature is in direct proportion to the quantity of confined air which the structure of their organs give them the means of retaining in the more delicate plants.

"6. The power of plants to resist extremes of temperature is in direct proportion to the capability which the roots possess of absorbing sap less exposed to the external influence of the atmosphere and the sun."

We are thus confirmed in our observations, and believe this to be the basis for important rules of observation and judgment of the endurance of a given variety of a species, as well as the law of growth to secure the highest condition of hardiness of the individuals of that variety. We have another phase of organic life in

the hybernate or dormant condition in which our hardy trees pass the winter, quite analogous to the winter life of many species of insects, and, if properly ripened, our hardy trees will as safely pass through our severe winters as do those insects.

Variety. — Qualities inherent in a variety or species may be modified by the conditions under which the tree may grow. We know that the human family become degenerated by a long course of enervating influences, and why not a given variety of tree? We are ever turning our eyes to new seedlings to secure greater hardiness and vigor, and so we will always be compelled to do. But "blood will tell," and vital force is inherent in some families more than others, even to the exclusion of some of the finer qualities, and to such we look for our hardy sorts. But we must not expect the highest development of all essential qualities of fruit with that of tree. The conditions of extreme hardiness of a tree are either *small size* and *rich fruit*, or *larger size* and *coarse fruit*. The Siberian family are typical of the former and the Russian of the latter, under our second general division, the geological. The soil must be so complete in itself that it shall furnish all needful elements of tree food, under ordinary treatment and conditions; and these elements must be in proper proportions, for the root has no power of choice, and if it absorbs an excess of one element to the exclusion of others as necessary, there will be a weakness of the tree apparent at once. Hence the necessity of an even balance in the soil formation to secure the best results. Trees grown in a bed of muck may survive a summer, but would be unfit for winter in this latitude. The same tree grown on a firm, dry, calcareous soil would make less growth, perhaps, but would be safe for any severities of winter.

The best tree soils of our state may be divided into three classes, viz: The *prairie loams*, the *calcareous clays* and the *clay loams*. Each of these contains all needed elements of tree food. The first often having an excess of humus, may produce soft, unripe wood, which, unless checked in growth by midsummer, will not endure the winter. The second, if well trained, will ripen its wood as fast as made, ready for extremes of both heat and cold. The third will do the same if not too moist, but there will be a tendency to late growth and immature wood.

AMERICAN MUSEUM CENTRAL PARK, NEW YORK. OF NATURAL HISTORY.

Immature wood is that in which development is not complete. We have all seen a midsummer growth arrested by slight frost, which brought death to all exposed succulent growths. The same degree of cold after a ripening period of a month would have simply hastened a more perfect maturity. Herein lies the chief difficulty of successful fruit-growing in Minnesota. Soil too rich in humus and retentive of water, which, with their warm autumns prolonging the growth up to the sudden check of their polar winter, and all unprepared, the tree cannot endure the trial. The tree must have its fluids well condensed *before* the severe frosts of winter come. Now, that soil which will — other things being equal — produce the most perfect growth of foliage and wood of the finest texture, that is hardened or ripened as made, will most surely produce the condition called "hardy."

CLIMATE. — I mean by this not latitude, but *temperature* and *saturation* (moisture). Death is caused not so much by the extreme of cold as by the relative conditions of the plant at its advent. There is no fixed degree of cold which kills a given variety or species. We may say of any given person or plant, that a certain degree of cold will almost assuredly cause death; but we may not say how much greater cold the same object may endure if specially prepared for the trial. We learn this from human life and the more delicate of plant life. M. De Candolle, the eminent vegetable scientist quoted before, says "that the northern limit of a plant is not determined by excess of cold, but by want of heat;" meaning that if the heat and other conditions of growth and maturity are perfect, a plant may be grown indefinitely beyond its present limit with safety. The cooler and dryer the climate in which a good growth can be attained, the more perfect the wood and the more cold it will endure. Plant-life requires the greatest saturation in extreme heat and least in extreme cold. A high temperature must have a greater degree of moisture to sustain life than a low one in summer, but there must be a ripening season corresponding with the extent and force of the growing season, or the plant will not be prepared for winter. There must be, therefore, a perfect balance of the elements of growth, heat, moisture and food.

Evenness of temperature or exemption from sudden transitions, is another condition. The reverse action, mentioned before, of

frost on vegetable fibre and watery fluids of the tree, have an important office in expanding the cells and softening the fibre, but if too abrupt in either the freezing or the thawing process, the results will be disastrous. So we want the changes of temperature to be gradual and in their regular order and season.

See *American Journal of Science and Art*, March, 1840; for paper by Dr. Lindley on "Frost."

Climatic influences are so much modified by altitude, aspect and drainage, that these fill a large place in the conditions of success. Comparative elevation secures exemption from extreme heat and cold to a remarkable degree, and at times when the tree is in most danger. Thus an elevation of thirty feet above the surrounding level, and a northern aspect, saved our nurseries April 15th, 1875, when on a lower level and southern aspect not eighty rods away, every tree was as good as ruined. In the latter case, the trees had passed into the sappy state of spring growth, and when the mercury fell to 15 deg., as it did the night of the 15th, it carried death to the tree. In the former case, the cooler aspect and elevation retarded growth until the danger was passed. Comparative elevation of thirty feet may give 10 deg. less of heat in the warm days of February and March, with 5 deg. less of cold the following night, against that on the ordinary level. The same situation may have a temperature of 35 deg. on a cool night, blooming time, when the other has that of 28 to 30 deg., which will generally kill the young fruit. This illustration, so familiar to all practical fruit-growers, shows the importance of location.

I may say here also that under-drainage is another factor of success, for it not only promotes early maturity and ripeness of wood, but often secures 2 to 5 deg. of heat in frosty nights when the crop of fruit is in danger from frost.

The foregoing are natural conditions, but we have in our fourth general division another series of conditions, artificial, such as *mode of propagation*, *culture*, *fruiting* and *pruning*. Some claim that the use of a *hardy stock* will make a hardy tree, and maintain that even a half-hardy variety may be so grown and be successful. We have no warrant or analogy in nature for this claim. It is a delusive theory. If the stock could give character to the cion, such would be manifest in more ways than one. The stock is but the vehicle by which raw material in solution is con-

veyed to the laboratory of digestion — the foliage — for which service it receives, or should receive in return, its share of assimilable matter for its sustenance. This it does, with no power of choice, while the leaf performs the main functions of choosing or rejecting, and elaborating material needed for wood and fruit. Example: the pear on quince, Mountain Ash, thorn or apple; also the Siberian on common apple. All these will be changed in conformation by the peculiarities of the cion, and the more congenial the union the more influence the cion has in this transformation. We must rely mainly upon the cion for our ultimate root, and so cannot make a hardy tree by using a hardy stock.

CULTURE, or condition of growth, has much to do with the endurance of the tree. If we grow too fast or too late, no degree of vital force can save it from the extremes of cold. If you neglect culture altogether, the tree may not survive the attacks of predatory insects. That culture which promotes an early growth with early and perfect maturity of wood, is the most favorable to hardiness. *Exclusive pruning* is not conducive to hardiness.

PRUNING, in its time and manner, or style, is an important factor here. Every bud, spur and nodule is a life-center, and the more of them the more vital force in a given space, is a principle of vegetable physiology. Therefore short growths are more sure to be hardy, and excessive extension is not desirable where we want great hardiness. I believe extra hardiness requires exactly the reverse of the common mode of high tops and long, lank limbs. I would sooner cut back frequently than trim up. Varieties differ much in natural conformation of top. It would be safe to cut back those inclined to be long-limbed, but seldom safe to cut them out of one naturally bushy. No more suicidal plan of pruning can be practiced than one we recently saw commended in one of our standard agricultural papers, viz: to "head the tree four to six feet high in the nursery, and then trim up to eight feet in the orchard." This practice rests upon the false notions that a tree needs cultivating near its base, and that it is not worth the land it grows upon, or else in *fashion*. I believe hardiness, health, long life, ease of culture, fruitfulness, care of fruit, destruction of insects, and general care of orchard, would all be vastly promoted by heading low, even at the ground.

Summing up the foregoing statements, we find the highest conditions of hardiness to be:

1st. *Variety*, or race; and so we look to Siberia, Russia, Canada and the north generally, for varieties long tested and of approved native vigor and vital force.

2. A *firm soil well supplied with the elements of tree growth.* This is indicated by the native wood growth or by analysis of soils.

3. *Evenness* of *temperature*, or least possible sudden extremes. This is secured by proximity to large bodies of water, by comparative elevation, the cooler aspects, and the most open, airy situations.

4. *Culture* and *training* — to secure maturity or ripeness of wood, and that form of tree which is most self-protecting.

I believe a careful observance of these conditions and of the special adaptation of varieties to soils, will secure general success in fruit-growing, fully equal to that of the most successful of the present time. The pear orchard of Green Bay, and the apple orchard of Mr. Phillips, of La Crosse county, may be repeated in almost every township in the state up to the 44th parallel, and in some townships on every quarter-section of land that has a good native growth of hard wood timber, or on the rolling prairies of the southern sections of the state.

A WINTER MONTH IN NORTHERN GEORGIA.

Prof. SEARING, Milton.

At least interesting, if not profitable, to the garden or farm cultivator of our state or latitude, is the knowledge of the condition, processes, and practical results of the like profession in other states, countries and latitudes. This knowledge is especially sought for by the nomadic American proprietor, who has no very strong local instincts or attachments, and is ready to turn "carpet bagger" on short notice, and grow up with any new country, west or south. Indeed, it may not be going too far to say that the choicest morceaux of agricultural or horticultural reading, that the average farmer or gardener finds in his periodicals, are not the plain, oft-repeated gospel truths of good seed, thorough tillage,

liberal fertilizing, judicious rotation, a careful keeping of his stock, his tools, his accounts, and, perhaps, above all, his *brains*, but the delightful stories of *other* men's success *elsewhere*, of fields ordained by nature to give larger returns, of skies shedding more timely rains, of temperatures more merciful in extremes, of latitudes that produce as staples the fruits he occasionally delights in as luxuries. Now the paradise is a Florida orange grove, now a sheep range in Colorado, now a cattle ranche in Texas, now a peach orchard in Delaware, and now an almond grove in Southern California.

Just one year ago, urged partly by the need of rest and recreation, partly by a desire to realize a half practical, half (perhaps) poetical dream of a horticultural paradise of my own, and doubtless, partly, by the unreasoning nomadic instinct above referred to, I left Wisconsin for a month's sojourn in what I had reason to believe was one of the most inviting and sunniest regions of the "Sunny South." It will be my aim to record in this paper the general results of my observations and reflections there, for the benefit of others who may be meditating a permanent change to a more genial clime. A desire to be absolutely impartial in comparing and measuring advantages, will, it is hoped, be manifest — a desire, perhaps, now more easily realized, after the lapse of nearly a year since my return.

Leaving Madison on the crisp, bright morning of February 5th, while the sun was thawing the frozen mud, snow being entirely wanting, I soon ran into my first surprise — not laid down in the books — the further south I went the colder and more disagreeable became the climate. Near Chicago appeared snow banks. All through Indiana, and half through Kentucky, snow lay everywhere in patches. In Louisville, the second morning after my departure, large heaps of muddy and frozen snow were everywhere piled up at the curbstones. In the hotel, coal stoves appeared as indispensable as in Madison or Milwaukee. In Nashville was found a cold rain, with *mud* only approximately equaled here by State street in its ugliest day. Five days are consumed in easy stages of daylight travel, with half a day in Louisville, and two days in Nashville. A raw Saturday night finds me at the objective point, the little city of Marietta, in Northern Georgia, twenty miles north of Atlanta, the capital. I am expected, and a bright coal fire in

my room dispenses cheerfulness and partial comfort. But unextinguishable surprise has been already holding me for many hours. Is this the Sunny South? Am I really in one of the gulf states? The senses do not realize it, and the mind almost refuses to believe it. Nature's look is about the same here as in Wisconsin. Here, too, she is dormant, under the influences of winter. The trees are bare, and have a wonderfully familiar appearance. The oak appears to prevail, and with it are our old friends, the hickory, ash, elm, poplar, wild cherry, maple, etc. The numerous chestnut trees, and the varying soil and contour of surface, remind a New Yorker of his native state. Indeed, this impression that I was in the Empire State, not of the south, but of the east, seemed to be with me constantly while within her borders. It was peculiarly strong when one day I came upon a group of a dozen venerable beeches, whose smooth gray bark, covered with initials and other hieroglyphics, mutely testified to the far-carving power of the national jack-knife.

While at first view the native trees and forests of North Georgia appear in winter very like those of our own latitude, a close inspection reveals a greater luxuriance and freedom of growth than is usually found in the north, especially in the northwest. The white and red oaks, for example, are far larger and nobler trees there than the white and black oaks here, which they respectively resemble in general outline. I was particularly struck with the noble trunks and symmetrical heads of multitudes of red oaks, both in grounds about dwellings and in forests. Our own common, uncertain, worm infested, nearly good for nothing black oaks appeared to be there, under happier conditions, the noblest Romans of them all. So also the hickory, far more common there than with us, attains more majestic proportions — probably twice the average Wisconsin size. While the nuts, equally overgrown, would be the delight and astonishment of the northern school boy; he would frequently find them beyond the range of his clubs or his climbing.

But above all did I pay tribute of admiration and surprise to the half score or so of beeches, a unique company of giants, into whose presence I unexpectedly came one afternoon, as already intimated. I have seen good-sized beeches growing in moist and fertile spots in the northern states — New York, Ohio and Indiana — but none to be compared with those in either size or symmetry. The trunks, smooth Tuscan columns of sixty or eighty feet, without

branch or knot, were surmounted by grand heads, to which age had apparently given no defect. The beech is a slow grower. The present age of those trees must be reckoned by centuries, and they seemed good for one or two centuries longer. This evidence of the wide range of the beech, and its adaptation to so low a latitude, was a surprise to me, as it must be to many northern admirers of this interesting tree.

As the trees of North Georgia are substantially all deciduous, like our own, save the pine, which is unevenly distributed in the parts I visited, somewhat as in portions of our own state, it is only on close observation that in the winter time, trees unknown at the north can be distinguished. These are numerous, nearly all of inferior size and inconspicuous. One, however, soons learns to know the sweet gum, the persimmon, the fig, the Pride of India, lime, oak, etc. The last is here a small and insignificant tree, and the Pride of India is, deprived of its foliage, a sprawling, ugly, scrofulous looking tree, in which no right-minded man, out of India, can feel any pride. Of pines, I saw no large ones in the vicinity of Marietta or Atlanta, although small ones of recent growth are abundant, scattered about in old fields that have been neglected, or gathered in groves in places more adapted to their growth. The pine appears to spring up spontaneously almost everywhere in neglected places, and grows with surprising rapidity. I saw groves of pine fast putting on the appearance of the forest primeval, in which were trees a foot in diameter, and my credulity was not a little taxed when informed that they were covering old fields, under cultivation up to the time of the late war. Trees of all varieties grow there much faster than here.

Of fruit trees, to which my attention was especially directed, Northern and Middle Georgia appears to be peculiarly adapted to the peach. The healthful appearance of the tree, alike in all conditions of care or neglect, and the universal testimony of the people, convinced me that nowhere else in the Union, are soil and climate better adapted to the growth of this delicious fruit. It attains here a size and flavor decidedly beyond the average in New Jersey, Delaware or Michigan, and the crop is seldom cut off or reduced by its only enemy, an untimely spring frost. Yet strange to say, there appears to be, at least in the localities I visited, no market for this fruit. There is no home market, because every-

body has enough, and no one needs to buy, and a foreign market appears not to have been thought of, or to be beyond the reach of the feeble enterprise which finds its scope in an orchard of half an acre or less, and the consignment of the surplus crop to the active jaws of swine. I will say, however, that I discovered one man who had the previous season prepared forty or fifty dollars worth of the dried fruit, but he had been put up to this by a villainous agent (undoubtedly a northern carpet-bagger), who urged him to purchase a patent dryer at four times its real value, and agreed to take his pay for it in peaches. You will not be surprised if I add (what is strictly true) that at the time of my visit the patent dryer was doing good service as a hen roost in one of the gentleman's outbuildings, and was well fertilized in all parts for the next year's need.

There appeared to be no reason why a man, yea, many men, of the requisite business character and some capital, might not find peach growing in Georgia on an extensive scale, for northern markets, a very profitable business for some years. The fruit reaches maturity there nearly or quite a month earlier than in Delaware and New Jersey, and its superior quality ought to render it readily salable in large quantities in northern cities.

As to the apple, it is evident this does not, in general, flourish at so low a latitude. I saw very few apple orchards in Georgia, and the few to be seen looked less thrifty even than those in Wisconsin. It is stated in the "Hand-Book of Georgia," an interesting and generally accurate compendium of the resources of the state, issued by the energetic State Commissioner of Agriculture, that "The *apple* succeeds well in every portion of the state where there is an elevation of four hundred or five hundred feet, and a clay soil or subsoil, both of which are generally found combined in Upper, Middle and Northern Georgia." This must certainly be taken with a large grain of allowance. It is about as true as would be the statement that the apple succeeds well in most parts of Wisconsin. My observations and inquiries at and in the vicinity of Marietta (one thousand one hundred and thirty-two feet above the sea, and nearly the highest point on the track of the railroad between Chattanooga and Atlanta), as also in Barstow, the adjoining county north, and at Atlanta itself, which is one thousand and fifty feet above the ocean level, convinced me that only a few

varieties of the apple can be successfully grown there, and those only under somewhat exceptional conditions of soil and management. The experiment has been pretty thoroughly tried. Georgia is not a new state, and the mere fact that nearly all the apples to be found there in mid-winter, are from Michigan, is evidence enough.

There appeared to be quite a general inclination on the part of those having experience, to ascribe exceptional qualities of hardiness, productiveness and long keeping, to a single variety, the "Shockley," which now enjoys in Georgia and other southern states, a peculiar and growing popularity. It is not an apple of more than fair quality, but it is in other respects very desirable for that latitude, especially in its keeping qualities, and finds a ready sale at a fair price, in Atlanta and other southern cities. I visited and carefully inspected, two or three times, a fine orchard of some one thousand two hundred trees, half or more Shockleys, two or three miles south of Marietta. These trees were about a dozen years old, and in thrifty appearance and beauty, with few exceptions; all that could be expected or desired in any locality, north or south. They covered nearly forty acres of ground, while another forty acre lot had been, two or three years before, planted exclusively with Shockleys, and the young trees here would have delighted the professional eye of any northern nurseryman.

Pears were formerly grown with excellent success in Middle and Northern Georgia, but the blight has apparently swept off most of the old trees. I saw but very few pear trees, and they had generally a despairing look. Sweet cherries, and the finer plums, are not successfully grown, but figs do well, even in the hill country, and still better in Middle and Southern Georgia. Blackberries and raspberries are very abundant, and strawberries yield large returns to fair culture, without the necessity of any winter covering. Certain varieties of the grape do well, particularly the Scupernong, an excellent wine grape, and quite generally grown.

Of more purely agricultural products, I found, to my surprise, cotton to be the leading staple, even in the northern counties I visited, and chiefly relied upon as the money crop, although it affords, at its present price, rather scanty returns for the great labor and care it exacts. Wheat is also grown to a considerable extent, said to be unsurpassed in quality, and bringing, as it did, twenty or twenty-five cents more per bushel in the Marietta market, than the

Wisconsin farmer can get in Madison or Janesville. I could not see why its culture in Georgia should not be profitable. Indeed, I think many farmers there are finding it so, with the judicious use of the fertilizers, now beginning to be largely used in that region. I will add here, parethentically, that from the only partially deodorized fertilizers, kept for sale in large quantities in a warehouse in the center of the city, came smells more multitudinous and direful, than those once counted in the city of Cologne. The drystn never called out such from the turbid waters under Milwaukee or Chicago bridges. They are, however, doubtless, full of hope for the future of Georgia agriculture. Indeed, the intelligent use of them is unquestionably helping to solve the problem of renewed prosperity for the south, under conditions more like those prevailing at the north—small farms under the personal direction of owners, and a greater diversity of products.

I should do injustice to the Georgia climate, if I allowed the already brief allusion to it to go without further comment. A Georgia winter is less mild and agreeable than I had supposed, but it is nevertheless, in many respects, a pleasant season. There was scarcely a day in the month of February, in which a fire was not necessary for comfort indoors, and an overcoat out of doors. I believe that for the three months, December, January and February, a good house, well warmed, is almost as much a necessity for health and comfort in Northern Georgia, as in Wisconsin. The fuel required is less—probably not more than half the amount—but not a little fuel is needed, and for proper comfort, *stoves* or furnaces, instead of the prevailing open fire places, which during the three months mentioned, are delusions in most southern houses. The ground seldom freezes more than one or two inches, but the northern and eastern winds are raw and cold. There is, however, a good deal of sunshine in a Georgia winter, and whether the day be cold or warm, the air in the hill country is as pure and bracing as any within the borders of our own state. I believe a more healthful climate cannot be found. In this respect it is doubtless even superior to that of Wisconsin. Extremes are unknown there, as well as sudden and great changes of temperature. Not only the winter, but also the summers, are milder than with us. Fierce heat and fierce cold are unlike unknown there. That our extreme midsummer heat is there rarely known, is proved by thermometrical

records published, as well as by the oral testimony of northern residents. The cause of it may probably be found in the less inequality in length between the days and nights, the longest days of summer being nearly an hour shorter than ours, and the nights correspondingly longer. The sun has therefore less time to accumulate results of torrid heat than with us. The water, moreover, is excellent, whether in wells or in the abundant springs that everywhere burst out in valleys and hillsides, feeding the pebbly and sparkling brooks that abundantly water every farm and, I had almost said, garden in the hill country.

Fuel is abundant, excellent and cheap. Indeed, the primitive forest appears yet to cover at least one-half of the whole country, giving it the look of a comparatively newly settled state. One other marked virtue of North Georgia is the excellent roads, as good there in mid-winter as here in mid-summer. Frost adds little permanence to mud, and a few hours after a rain, the roads appeared to be in general hard and smooth.

The price of land seems ridiculously low, ranging from two dollars to fifteen dollars per acre, according to the improvements. The farm of three hundred and three acres, containing the two forty-acre orchards above referred to, and in other respects one of the best I saw, excellently watered and timbered, with a good surface, and fair to good soil, but indifferent buildings, and located only eighteen miles from the capital of the state, two and one-half miles from Marietta, and within eighty rods of the railroad joining the two cities, was offered to me for less than fifteen dollars per acre. The title was unquestionable, and the annual taxes aggregated three-fourths of one per cent., on a low valuation — less than in the rural township of Rock county where I now reside.

It may be asked, What of the people? A residence of a month is doubtless too short to qualify one to speak with certainty or authority of the characteristics of the people of any particular locality; but I certainly found no reason for doubting the general accuracy of the following conclusions, drawn from my observations and inquiries: 1. The intelligent, educated, property-holding class, who usually give direction to social and political sentiment in any community, are sincerely desirous of rebuilding the prosperity of the state, upon the sincerely accepted basis of the Union. 2. They lack the energetic, practical business characteristics of northern

people, and lack also the money capital requisite for the proper development of the great natural resources of their state. 3. They are conscious of their deficiencies, and are anxious for the co-operation of northern energy and capital. Northern men are wanted in Upper Georgia, and will be as cordially welcomed there as in the newer states of the west and northwest. 4. Even with the present disadvantages above mentioned, the people of Georgia have been and are being educated by their changed conditions, and their own necessities, to a more general, varied, and intelligent activity, and the state is making at the present time, chiefly through its native population, substantial and, I may say, remarkable progress. The system of small farming is taking the place of the old plantation methods. Improved agricultural processes are slowly bringing back fertility to exhausted lands. There is a large and, in the main, intelligent use of natural and artificial fertilizers. There is an increasing demand for good implements. Public instruction is surely, if slowly, advancing, upon the basis of a state educational system very similar to our own. Its scope embraces impartially both races, although, owing to poverty, sparseness of population, and prejudices against the innovation of local taxation for educating "other peoples' children," neither race as yet has, as a general truth, save in the larger cities, anything like the educational facilities we enjoy and prize at the north. Financially, the state is in excellent condition. The laws appear to be well and impartially administered.

In conclusion, what advantages does this region offer to a resident of Wisconsin, inducing him to migrate? I believe it offers few such inducements to one who is fairly settled and at home here. Wisconsin, unlike Vermont, in Douglas' well known characterization, is too good a state to move from. The soil here is so good, the air and water so good, schools so good, society so good, the general prospects for the larger future so good, that none but a very wise man or a very foolish man will seek to leave it — a very wise man, who, by his keen sight, has spied out some rare place certainly better, or a very foolish one who simply seeks a change. Yet if the latter is bent on moving, and asks me where to go, west or south? I unhesitatingly say, content yourself with the folly of going south, instead of the greater folly of going to the distant and new west. You pay no more for land in the south; you have a

fine climate, wood and water are abundant; you are vastly nearer the seaboard (a perpetual advantage), and you will help build up a grandly endowed, but sadly unfortunate country — a country surely destined to yet see a return of far more than its ancient wealth. Taking part in so good a work as this, your folly in leaving such a state as Wisconsin may almost be accounted wisdom.

VARIETIES OF APPLES ADAPTED TO THE NORTHWEST.

A. J. PHILLIPS, WEST SALEM.

I take it for granted that President Smith well understood what he intended to draw out when he set this subject apart for my consideration, by associating the word west with the north; for that entirely changes the subject. While the north would take us into fine orchards in Canada and in the vicinity of Lake Ontario; in the northern part of the state of New York; into as fine a fruit region as can be found; also into the northern part of Michigan in the vicinity of Grand Traverse Bay, where the peach grows and flourishes; and in our own state it takes us to the home of our worthy president, in whose locality pears grow in such profusion that they care so little for them that when they go to the fair they hardly stop to pick them, but like the careless boys when they go out to gather persimmons or choke cherries, walk up and break off limbs loaded with delicious fruit; and to hang them in a conspicuous place when on exhibition, would seem to aggravate such men as Kellogg and myself, who can hardly make it pay to raise them for five dollars each. I say while the north takes us to these chosen localities where the list of apples and other fruits adapted would be very large, adding the word west he drives us from these and locates us in portions of Wisconsin and Minnesota where it is cold — yes, very cold — and as a consequence the list of apples adapted, where the thermometer runs down often to twenty or thirty, and sometimes to forty degrees below zero, is very limited. As I have been many times misled by reports and articles on this subject as published in various transactions, and as stated to me by nurserymen or their agents, and having lost not only trees but time and

money by it, I may be over careful in selecting varieties for the northwest, as it must be evident to every thinking man that there is no safety in planting an orchard of trees that cannot be relied on to endure the probable extremes of cold in the locality where they are to grow. This is a conclusion that we sooner or later must come to; when we look around and see the dead and dying trees that once were cared for, and now are despised and neglected, we cannot but conclude somebody has made a mistake — the man who sold, or the man who bought. To make fruit or apple growing a success there must be a limit fixed by two facts; first, the probable intensity of the cold, and the possible resisting powers of the trees. And now comes another point to be considered in this subject, that is, different localities in the same latitude. I may be wrong in my conclusions, but in this essay I can only give you my opinion, formed as it has been by six years of tree planting and apple growing in the northwest.

Now for the varieties. They being so few, I am obliged to write something by way of an introduction or my paper would not be noticed, especially by nurserymen. In the valleys and on the open prairies which abound in the northwest, the only varieties that I would consider adapted, and they not always certain, would be Transcendent, No. 20, and Hyslop crabs, Duchess, Wealthy and Fameuse, standard apples; and if any one engaged in growing apples, or contemplates growing, should think this list too small, I would increase it by adding more Duchess. And then the only way to be successful with the six varieties I have named, would be to plant a few trees of each variety every year; and by keeping them well mulched and cared for, any farmer could raise apples sufficient for his own wants; and that is no small item.

But if the location should be in the timber lands or on elevated clay soil underlaid or mixed with limestone, I would make a few additions to the foregoing list, but with the warning to all growers, to care well for the trees; plant none but healthy and vigorous two or three year olds; mulch well, and make up your mind that when the thermometer runs to thirty or forty degrees below zero, your crop of fruit the next summer will do but little in supplying your family or paying ten per cent. interest. Well, what are the additions? I would add Red Astrachan and Tetofsky for early apples, but would go very light on the first. For fall, I would set

Haas, Utter, Alexander, and Price's Sweet, but light with the last. For winter, I would set quite extensively of the Willow Twig on account of its long-keeping qualities; Golden Russet, for the same reason; Pewaukee, for the same reason and also for the quality of the apple; Red Queen, a Russian variety, for the hardiness and beauty of growth, hoping that the fruit as a winter apple will prove satisfactory. I would also set a few Talman Sweets, as a winter sweet apple is very good to have in a family. Then I would set two of the Moscow, and about two of every variety of Russians that you can get hold of, in hopes that in the lot there may be some valuable hardy varieties, that when a hard winter like 1872 or 1873 comes this way, some of them might possibly survive to tell the tale to coming generations yet unplanted, and serve as a warning to all who wish to engage in fruit or apple growing as a business, to locate in some more favorable locality than the frigid northwest. Now if anyone who reads or hears this article read should be tempted to select a location like the one I have described, and goes to work and sets the varieties I have named, and adds all others that are recommended and grown by all of our nurserymen, and is bound to make apple growing a success, all I can say is, it is not my fault, and I heartily wish such an one God speed; and he will be successful if he has some very wealthy relations that are disposed to help him financially whenever he needs assistance to fall back on. But don't think by the foregoing that I am at all discouraged; not a bit of it. It was said that a lady once made the remark, while attending the funeral of her ninth husband, and looking over the assembled audience for a suitable one for the tenth, "that if it were not for *hope* the *heart* would *break*." That is my case; if it was not for the hope I have that in addition to the Wealthy some new seedlings may yet be discovered, or that out of the many Russians now being tried here and in Canada, there will something be found that is as perfectly adapted to stand the climate of the northwest as the oak, maple or elm is, I should be bankrupt and discouraged. I have for four years been setting a few grafts of the hardiest varieties I have found, so that now I have a few trees of No. 20 and Wealthy that I could spare to my neighbors; but here a new difficulty comes in: I can't afford to give them away, and if I sell, that places me in the professional list of growers to exhibit with at the fair, and they are a difficult crowd to compete

with; but if this article should advertise my stock so that I do sell some, I'll have to stand it.

Mr. Phillips — My paper is brief, for two reasons: One is that it is a very limited subject, and the other is, I saw by the programme that Mr. Gideon is to follow me; and he has had large experience in the business, so I thought I would make my paper brief and give him a chance to teach us something. I suggest that Mr. Gideon read his paper, and then we have a discussion on both. I think it will bring the subject matter better before the meeting.

Mr. Tuttle — I set twenty-five trees of Fameuse twenty-five years ago, and I think they have paid me better than any twenty-five acres of land I have on my place. In Wisconsin, it is probably a better apple than it is anywhere else where it has been tried. It wants a warm, dry atmosphere; even on the lake shore or in Michigan it mildews, and in Canada it is considerably smaller than it is here, and so in New England. It reaches its greatest perfection in Wisconsin; you do not need anything better. On all good fair locations it will do well.

Mr. Kellogg — It depends a little on where a man lives what he recommends. Now we were very much amused with about six lists made up here by different fruit growers in the state, who were requested to recommend the varieties with which to set out an orchard. One man recommends ninety-nine Duchess of Oldenburg out of a hundred, and the other a Duchess. Another in the same list recommends fifty.

Mr. Phillips then read the lists of varieties suggested by the several fruit-growers.

Mr. Stickney — I wish to say in explanation of my recommendation that the question was put to me on the wing, as it were, to answer off-hand. Although by mature deliberation I might find something else I could add to that list, I still have two arguments to present in favor of the list I recommended. One is, that it is simple; the other is that I have taken my own medicine, having very recently planted four hundred and fifty trees — four hundred and forty-nine Duchess of Oldenburg and one Duchess; this, however, was for the market of Milwaukee. They were planted for dollars and cents. I think I had rather plant them than four hundred and fifty trees of any other variety.

Mr. Plumb — In furnishing a list of trees, the location is a very

important consideration. When a gentleman orders a bill of trees, he should state carefully what the local conditions are. It is one of those things which should never be omitted.

Mr. Dore — It seems to me that at each annual gathering of the nurserymen and horticulturists of this state, they can do no better favor to the people who wish to plant trees than to agree upon some list that they all will say is the best; then it is a plain, simple matter for ordinary people to follow it.

President Fratt — Do you think they could agree?

Mr. Dore — I do, on the same principle that a jury agrees — shut them up somewhere until they do; not buy any trees of them until they agree. I know that the recommendations of prominent fruit-growers in this state, who have a reputation for fair dealing and honesty, would count for more than any itinerant tree peddler's recommendation. There is no nursery near to us, and none very near that ought to be patronized, because they are not on the same kind of soil; there are none except on the land that lies between prairie region and the timber region. The nurseries nearest to us I think we ought not to patronize. I think their trees are not adapted to our wants; and if we go to the northern or southern portion of the state, the work there is done by these tree tramps. A man will come there, and if Mr. Gould's nursery, at Beaver Dam, has a good reputation, he is selling trees from Gould's nursery, and they will come from all over creation except there. It is a matter well known to some of us that such has been the practice. Now if you nurserymen can do something to protect those men who want to plant trees and do not know what to plant, you will find that it will greatly advance your own interests, at the same time that it will secure them from impositions of this kind. I have sometimes thought that there ought to be a penalty for this imposition; perhaps the general laws would reach the case. It seems to me it is worse with this matter of trees than with agricultural implements, if possible. The only guaranty that a farmer has that he is going to receive the variety of trees he desires, is the reliability or responsibility of the nurseryman; that is, the ordinary farmer, who is not capable of judging varieties from the appearance of the trees; and there ought to be something tangible to this state society that we can rely upon, and get trees that we know are just what they are recommended to be; and if we find any nuseryman who

does not deal honorably and squarely in that direction, he should be exposed and the people should know it.

Mr. Gideon — I was just going to remark that in sending out a list of trees that would succeed, or are succeeding in Wisconsin, in order to guard tree planters against imposition, it would be well to attach the price to them, because these tree-peddlers would then sell nothing but the trees recommended; but to attach the usual nursery price to them would kill the peddlers, because they sell them at from two to ten times the usual prices.

PROPAGATION OF NEW AND HARDY VARIETIES OF APPLES.

PETER M. GIDEON, EXCELSIOR, MINN.

Mr. President and Brother Fruit-Growers: By request of your honorable secretary, Mr. Case, I herewith submit a report of my experience in fruit culture, and especially in regard to the production of new varieties; and to that end will confine my remarks to the last twenty-five years, beginning with my efforts in Minnesota. My first attempts at fruit culture in Minnesota began twenty-five years ago by the setting of 450 trees in an orchard, consisting of thirty varieties of apples, a good assortment each of pears, plums, cherries and quinces, with the planting of one bushel of apple seed and one peck of peach stones; and each year thereafter for eleven years, planted eastern and southern apple seed, and never less than to grow a thousand trees; and to-day but three trees remain. The grasshoppers of twenty-two years ago killed many, and later the leaf-lice killed some and the blight more: but the great mass of ruin came from the extremes of climate. Nor were the first setting and the seedlings all I set and lost during that space of time; hundreds were obtained of various ones, but all went in the common ruin. One of the three left has been top-grafted with a better variety; both the others have been girdled by the blight and the entire top taken off, but have sprouted and will again make good trees.

But since the first twelve years I have planted only home-grown seed, with results that would encourage the most desponding. The

first seed planted of our own growing were from the Duchess and the Cherry crab; and later from the Wealthy and a seedling crab. The greater portion of all these are now in bearing, some three hundred or more in number; they average in quality of fruit, full better than Hislop or Transcendent, and nine of them well worthy of culture, will bring a first-class price in any market, and in season from first of August to first of January, and in tree, all as hardy as our native oaks. We have had quite a number of seedlings come into bearing at four years from the seed; more at five, the great mass at six, and but few go past nine years without fruiting.

The general average in quality and size of fruit from the above named varieties was about the same; of the nine best, the Duchess gave four, the crab seedling three, the Wealthy and cherry crab one each, with nearly an equal number of trees of each set. The number yet to come in from later plantings of seed amounts to thousands, all the product of a great variety of our very best trees.

All the first planting of our own growing of seed was from hardy varieties, all summer, fall or early winter, some being grown in close proximity to the longer keeping varieties that bloomed and fruited at the same time, and the result showed the more tender to have mixed with the crab seed, causing many of the forthcoming seedlings to be tender, though in appearance perfect crabs in tree, while other trees were perfectly hardy from the same lot of seed, though many of them represented the more tender surroundings in tree and size of fruit, and especially so in regard to the Blue Pearmain, a tree differing as widely from the crab as any other, yet perfectly reproduced from a crab seed, so far as tree and size of fruit, but not in quality or time of ripening. The great majority of seedlings ripen their fruit at or near the same time the parent apple did, from which the seed were taken; a few only varying from four to six weeks, and but one showing a greater deviation, and that a crab seedling, and that only eight or ten weeks, extending the season to the first of January.

Therefore, seeing the tenacity of the seedling to ripen its fruit at or near the season of the parent apple from which the seed was taken, we have changed the programme, and now plant seed of long keeping varieties, trusting to the cross with our most hardy to give hardiness to the forthcoming tree, and at the same time retain the long-keeping qualities in the fruit by the same law that gave us

only early apples from the seed of early ones. At the outset we don't expect every seedling will prove perfectly hardy and of the best quality of fruit, but expect a gain — some ironclads in tree, with first-class fruit.

The process by which to attain the hoped-for results, you see, is through the natural flow of pollen, a hardy variety so instilling its nature into the seed of the less hardy long-keepers as to make the forthcoming seedling as hardy as a crab. For we find that the common apple has the same influence on the crab that the crab has on the common apple, each through their pollen reproducing themselves in the seedlings of the other. Thus from the same lot of crab seed, grown in close proximity to tender varieties of large apples, we find some of the trees prove tender, though perfect crab in form of tree, while in others the tender variety reproduced itself in the outward form of the tree and in the size of the fruit, yet the tree in constitution and quality of fruit is a perfect crab. And thus through various crosses we were enabled to solve the problem as to how we can get a first class of apples in succession the year through. We find in our crossbred seedlings the range of deviation to be almost boundless, no two alike in tree and fruit, and no two alike in size, color, form, season and quality of fruit, so that every tree is a distinct variety; only in one instance did a seed reproduce the parent in all particulars, and that was a cherry crab.

The nearest we find an approach to a fixed law in the reproduction from seed is in the time of ripening, the parent apple from which the seed was taken governing the season. And therefore, in the management of the state experimental orchard, we insert no variety, late or early, but of best quality, thereby avoiding all chances of deterioration in quality of fruit, and at the same time and by the same means hope to combine in one apple more good qualities than have been yet attained; for such a seed-growing orchard as we have inaugurated was never before set in motion.

We set alternately in row, a tree of a hardy variety and a long keeper; the long-keeper not being perfectly hardy, we top-graft with our hardy seedlings, which mature their wood and stop their sap flow early, thereby compelling the artificial late growing variety on top to ripen up for winter. Yet it is not every variety that can by this process be made hardy enough to withstand our most

extreme winters, but enough of first class in quality of fruit can be had to answer our purpose in the pursuit of more and better the year through.

The experimental orchard is intended as a lasting institution. It is designed to cull out and insert better varieties as better are found or developed in the lapse of time. Every year the seed is to be carefully saved and planted, each variety to be carefully labeled, and the results carefully noted, as each tree, or set of trees, come into bearing. The orchard contains 745 trees, grafted and set last spring, and it will require some ten years to see any results from it, as these trees have first to fruit, and the seed therefrom to grow into trees and develop their qualities of fruit.

Mr. Smith — Are there many new apples coming out in Minnesota that promise to be of any value?

Mr. Gideon — Not many as yet. There are some in the southern portion of the state that have got some little note, that are not known to have any crab in them, but whether they will succeed when taken out of that immediate vicinity, is a question. There is a certain portion of Minnesota, around Winona, where they appear to be able to grow anything that they plant, and these new seedlings are mostly in that neighborhood; not yet tested outside.

Mr. Smith — The Wealthy is the best of anything you have.

Mr. Gideon — The Wealthy is the best in size and appearance of anything that I have grown. I have some others as good in quality as the Wealthy, and fully as good and perhaps a little better, in training.

Mr. Phillips — I have understood that the state of Minnesota has an experimental farm, and they have taken this matter in hand, to have these seedlings cultivated for the benefit of the people in the state, and see if they can produce an apple that is adapted to the climate. I think Mr. Gideon has been appointed fruit commissioner of the state, and that they have appropriated a thousand dollars for the purpose of making these experiments. I think it would be well for him to explain just what course the state has taken. Perhaps it may induce our people to help our horticulturists a little.

Mr. Gideon — The state has purchased one hundred and sixteen acres adjoining my farm, and on that the experimental orchard is situated. I have charge of it. They pay me one thousand dollars

a year to run the concern. I furnish all the stock and all of the labor out of that amount. The expectation is for me to run it until the results are fully ascertained; I footing all bills and furnishing all stock, and putting in whatever I deem best. That is what has taken me out this winter to look around through Wisconsin and Iowa to find if there was anything better than I have on hand; anything really desirable in the orchard. I think from the condition of things, and the climate, that anything that will succeed there, will succeed anywhere in the northwest. I suppose there is not a more severe portion of Minnesota for tree culture than right through the center. This orchard is situated on a high point at the lake shore, seventy feet, probably, above the water, and at a point where there can be no neighboring orchard set that can possibly influence it. It is the only point, probably, in the state that would be really suitable for the purpose and exempt from all danger of being interfered with by other orchards. It is a matter that the whole northwest is really interested in, and it is my opinion that other states would do well to take part in it, because seed can be grown there in sufficient quantities to furnish the whole northwest without any enhanced cost over and above the thousand dollars per year.

Mr. Kellogg — I would like to ask if there is anything besides apples connected with the experiment.

Mr. Gideon — We will have a pear orchard set there in the spring, but so far as the growing of seed is concerned, the apple orchard is the only thing. I will state that I am setting several acres of other truck, pears, grapes and other things, but there will be no apple trees of any kind set except in that orchard.

The following letter on Forestry from Dr. Warder, was read:

A PLEA FOR TREE PLANTING.

JNO A. WARDER, M. D., NORTH BEND, OHIO.

Although a stranger to most of you, there are several who may consent to be addressed as *friends*, if only on account of parity of interest in the cause of our mistress; while other some will graciously accept the salutation on the score of former consociation with

the writer. Then again, though it has not been his good fortune to see more than a very limited portion of your beautiful and most varied state, which is remarkable for the diversity of its surface and soil, enlivened by its prairies, lakes and timber tracts; nevertheless your absent friend will presume upon this occasion, from his far off home, to appear before you with some suggestions, cognate to some of the great interests that will occupy your attention at the approaching joint meeting.

Your kind reception upon a former occasion was forcibly brought up from the caverns of memory last winter, by a very pleasant meeting with a former secretary of your agricultural board, now the worthily honored governor of Wyoming. And while traversing together her extended grassy plains, gazing upon the beautiful forests of her mighty mountain chains and exploring their hidden treasures, our memories instinctively reverted to the times when together we had first met at your beautiful capital among the lakes. Your choice products, your fertile soil, and your men of mark and of industry were pleasantly passed in review, while resting from the fatigues of mountain exploration, and we could but wish that an exchange would be made between these so distant and differently situated regions.

This being premised, you may wish to know what boon we desire you might receive from those distant mountains. Their gold and silver? No, indeed, but something that would contribute far more richly to your true welfare as an agricultural people — their trees!

With about three and one-half million acres of woodland, twenty-nine and three-tenths per cent. of the entire area of your state, the more valuable pine forests are confined to a comparatively small part of the forest area; and the reckless greed of the lumbermen has sadly stripped the accessible portions of the woodland, while nothing has been done toward the increase, preservation or renewal of the sylvan wealth of the land, except what nature herself has accomplished. But even her efforts have been sadly interfered with by the destructive fires that have been permitted to ravage the forests. True, the oak openings have grown up wonderfully since the settlement. To be sure, in the prairie regions you have, in self-defence been planting trees. This is well! Go on with the good work of embellishing your land, protecting yourselves, your cattle and your crops from the fierce winds, and in providing for yourselves and for

your successors good supplies of fuel and lumber that will be needed when the present forests shall have been exhausted. Plant trees in the prairies and keep on planting! All your best efforts will be required, nor need you have any apprehensions that the planting will be over done.

But you may improve on the *quality* of your planting, and it may be well to inquire into this. Your intelligence and the result of your observations will be trusted to guide you to a satisfactory result. Even in the timber counties you may vastly improve in the *quality* of the trees. In traversing the southeastern portion of your state, especially in the regions where the drift formation is largely developed, and rises into long slopes, the traveler is struck with the remarkable effect produced by the frequent planting of lines of tall trees, that have been introduced as wind-breaks. Though generally set in single rows, these trees undoubtedly exert a happy influence in breaking the force of the winds; but, let it be asked, do you not need something better than this foreign tree? Do you not desire to plant something that will be more valuable, and if so, let us consider the propriety of supplementing these with some of the beautiful, the hardy native evergreens.

The Lombardy poplar has been to you, what the cottonwood still is to the newer states beyond the great river, *the pioneer*. This poplar is from Europe; introduced into our continent in the last century, it has widely and rapidly spread over the land; it is no novelty. In all southern Europe it is frequently seen in long avenues by the roadside, where it is frequently cut back for its brush. In many of our soils it is a short lived tree, yielding poor fuel and inferior lumber; useful, however, for some purposes in the arts.

To show how it is appreciated by European foresters, the following quotation is made from one who stands very high in the pursuit of this important industry. My good friend Siemoni, in his *Manual of Practical Forestry*, says "that it is considered only a variety of the *Populus nigra*, or common black poplar of Europe, from which it is distinguished by its pyramidal orfastigiate habit, by its larger leaves with greater transverse diameter, by their deltoid and pointed form, with larger and more compressed petioles."

"This tree never produces any but male flowers, and of course no seed is ever seen, so that it is certain that the Lombardy can be nothing but a form (sport) of *Populus nigra* which has acciden-

tally come from seed, and which, on account of its beauty and other good qualities, has been largely propagated.

"The tree is increased by cuttings. It grows rapidly, and in twenty-five or thirty years it attains the height of thirty metres with a diameter of one metre*. It is said to live a century, but this is doubtful, as its wood after twenty-five or thirty years rapidly decays and becomes useless.†

This classical tree was thus referred to by Ovid in the fourth book of his epistles from Pontus:

> "Vos quoque felices, quarum clamantia fratrem
> Cortice velavit Populus ora novo."

The fable of Ovid made the ambitious youth Phæton sick to drive the fiery steeds of Phœbus; he found them unmanageable; they ran away, came too near the earth, set northern Africa on fire, producing the desert of Sahara, and curdled or dried up the blood of the negroes. Jupiter struck Phæton with two of his bolts, which destroyed him, and his remains fell into the river Po, whence the water nymphs rescued them, and he was decently interred on the banks. There his sisters lamented him unconsolably until Jove pityingly transformed them, as set forth by the poet, into poplar trees; and there have they ever since continued to grow and flourish.

This history is not without instruction in the consideration of some of the questions of vegetable physiology, that often present themselves at our horticultural meetings, and still more frequently to the thoughtful ones when engaged in their practical labors among plants, and will help to dispel the dogmatic dicta which are so often cited, and have even been accepted as truths: such as the running out of varieties, and that plants cannot be indefinitely produced from sections, or cuttings, grafting, etc., as though these processes were inimical to the species or variety. Now here is a seedling (in habit a sport), from the normal form as we now believe (though described and long considered a species), which has been grown by cuttings for twelve centuries, at least since immortalized by the ancient poet in the eighth century.

* A metre equals thirty-nine and a fraction inches.

† Manuale-Teorico-Practico D'Arte Forestale, p 136, di Giovanni Carlo Siemoni, Inspector General of the Forests of Italy.

Among our native trees there are many which will undoubtedly succeed in your soils. The several white oaks should receive your care. The ash, particularly the white ash; the green, which abounds in your latitude, though not without value, cannot compare with it in size. The hickories, though slow, are invaluable, and with the best species of oaks, may be planted with other kinds of quicker growth that can be removed to make way for the more valuable crop. Some of the elms, especially the slippery and the hickory elms, are of quick growth, and very useful as hard woods.

Of maples, plant especially the true sugar-trees, and the red maple. The wild cherry (black), or (*Prunus serotina*), particularly on light and open soils, *is* very promising. In proper soils the tulip tree and the walnuts should be planted, notwithstanding the length of time required to bring them to maturity.

Of conifers, in your northerly climate, and especially on the lighter gravelly knolls, even toward the north, you may confidently plant the larch of Europe, but not in low, wet ground, nor in the tamarack swamps occupied by its American cousin. But you have with you one who will sing its praises and tell you much better how well it thrives, at St. Francis. Of true evergreens, your attention is particularly directed to the native white pine, which should be planted by the million on your northern and western borders for forest purposes, and then *protected*, though its beauty and its great power of adaptation especially fit it for ornamental planting everywhere, even in the prairies.

The red pine is a noble tree and should be largely used both in forest and in parks. Of foreign pines, perhaps the Scotch pine may safely be recommended everywhere. Among the spruces, particularly valuable as a windbreak, the Norway is strongly recommended, on account of its rapid growth and its hardiness, and the closeness of its spray. The hemlock is one of the most beautiful evergreens we have for ornamental planting, whether singly set upon the lawn, in clusters as windbreaks, or in lines as shelter hedges; less valuable as a timber tree. "But, Doctor, did you see any of these in the Rocky mountains, to make you think of us here in Wisconsin?" somebody may ask. No, my friends! but their allies and congeners, the leaders of that mountain sylva. The Pinus *ponderosa*, *flexilis*, and *contorta*, the spruces, *Menziesii*, *Douglasii*, and *Englemanni*, and the fir, *grandis*, which there attained such noble

proportions on the rocky elevations, often approaching the line of perpetual snow, are so beautiful and so hardy they did indeed make us feel solicitous that our friends in the low lands of Wisconsin and otherwheres, should have the opportunity to enjoy their grace of form and color; so we then and there thought of you; in the natural revulsion of the human mind, turning from the high to the low, from the mountain peaks and deep ravines, to the broad expanse of prairie, with its gentle swell; from the solitary mountain desert, to the happy homes of men, were our thoughts and best wishes transported on the wings of thought.

And now, before closing this mental interview, this imaginary chat with my friend, who may feel it a proferred cup of Tantalus unless you were informed that these beautiful evergreens have at last been reduced to our service. From their wild estate, far off and far up, out of our reach, or, as rarities, beyond our ability to purchase, they have been brought in the seed, have been germinated by skilful hands, and on the soil of Illinois they are being *schooled*, and fitted for transportation and transplanting; and that in such numbers, that they will be within the reach of all tree-planters. For the experimental demonstration of their hardiness, their adaptation to fertile soils, and their *susceptibility* to *civilization*, we are indebted especially to the enterprise and liberality of our fellows of the Nebraska Horticultural Society.

And now if your patience has led you to this, the last word, be entreated to look into the matter of forestry, to consider its importance, to study its laws and principles, to master its practice; in a word, to unite your forces, especially your knowledge and skill, with those who have undertaken to make a beginning in the *foundation* of an *American Forestry*, and allow your absent friend to subscribe himself, *Yours in* VERDERIE,

JNO. A. WARDER,

AGRICULTURAL AND HORTICULTURAL CONVENTIONS.

Mr. J. M. Smith — Here is a resolution I want to bring before the convention before it adjourns, and while there is a good attendance. It is well known that a year ago, while we were in convention, it was found out that on our board of regents at the university there was not a single farmer; nearly the whole board was made up of lawyers. The convention then in session passed a resolution,

asking the governor to appoint some farmers upon that board, and it bore fruit very quickly. Our friend, Hiram Smith, was the next man appointed, and, as I believe, is a very satisfactory man, not only to farmers, but to everyone else. I have had conversation with him with regard to some means they have on hand, which I will call upon him to explain, after reading the following resolution.

"Whereas, It is understood that the board of regents of the State University have under their control a sum of money that may be disposed of at their discretion, for the benefit of the agricultural and horticultural interests of the state; therefore,

"*Resolved*, That the joint convention do request the board of regents to procure some suitable person or persons to hold meetings or conventions in different portions of the state, for the purpose of instructing the farmers in the different branches of agriculture and horticulture, and to appropriate such sum of money as is at their disposal, or as may be necessary, for the purpose of advancing the interests of agriculture in our state."

I will call upon Mr. Smith to explain the situation and condition of matters.

Mr. Hiram Smith — I would merely state that the question has been discussed before the board of regents, as we have a portion of the agricultural college fund at the disposal of the regents. Notwithstanding it has been said they are lawyers, they are gentlemen, and men disposed to do everything that is possible for the benefit of the country, and they are disposed to do what is feasible towards spreading agricultural knowledge. It has been suggested before their board, that, if a competent person was employed to go into different localities, a local influence would be exercised equal, perhaps not in talent, but in numbers, to that present here, and perhaps more would be benefited by the truths and principles promulgated, because we take it for granted that all who attend these meetings are pretty well posted; but in localities where they are lacking in much of the knowledge necessary to progress rapidly, they may be, and, I have no doubt would be, willing to bear a certain share of the expense that would be incurred. The State Agricultural Society and the State Horticultural Society, perhaps, would also furnish means and suitable persons to go at certain times, and in certain localities. The expense would not necessarily be much. The home meeting could be got up at home expense

altogether, and the traveling expenses of the professor or lecturer would be the main expense; and I think the board of regents would be perfectly willing to co-operate with the State Agricultural Society, or the State Horticultural Society, or the State Dairymen's Association. It is being done in Michigan and in Pennsylvania, and, unless some such steps are taken, a very few years will find the majority of our farming population behind those of other states in intelligence, which would be mortifying and unnecessary. We have ample means and opportunities to become as intelligent an agricultural class as any people in the Union, and by merely putting in motion the means at our command, we may inaugurate a system that will lead to very beneficial results in all the different branches of agriculture.

Mr. Field—I must say that I am very glad indeed to see such a resolution presented to this convention. It certainly meets my views most cordially. I think, however, it might be so amended as to include the Agricultural and Horticultural Society within its scope, that the board of regents might confer with them, and that it should be taken as a united work. It is possible, however, that it is well enough as it is. I fully agree with Mr. Smith that a little work and money devoted to this purpose may be made vastly beneficial to the agricultural interests of this state; and so far as the expense is concerned it need be but trifling. Notice could be given in advance through the representative agricultural papers of the different places where these meetings would be held, so that due notice could be given the masses of the people with very little expense; perhaps a few circulars distributed, thrown into their wagons, stating that there would be a meeting at a certain place at a certain time, and that certain topics would be discussed; the expense would be trifling aside from those of traveling, and I have no doubt that if this board and the societies should desire that free transportation should be furnished them, that it would be furnished by all our leading lines of railroads to any reasonable number of parties who desired to attend those conventions, or at greatly reduced fare, at least. In order that that matter may be talked over, I move that the resolution be referred to a committee of three, of which the mover, of course, shall be chairman, to make a report to be submitted to this meeting this afternoon.

Motion carried.

This resolution was adopted.

The chair appointed on the resolution offered by Mr. Smith, Messrs. James M. Smith, W. W. Field and A. A. Arnold.

The committee reported the following resolution, which was adopted by the convention:

"WHEREAS, It is understood that the Board of Regents of the University of Wisconsin have under their control a certain sum of money, a part of which may be used in their discretion for the advancement of the various industries of the state; therefore,

"*Resolved*, That this joint convention requests the said Board of Regents to procure suitable persons to hold conventions in different parts of the state, for the purpose of disseminating information of value to those engaged in the different branches of agriculture and horticulture and other useful industries.

"*Resolved further*, That we request the presidents of the Agricultural Society, the State Horticultural Society, and the State Dairymen's Association, to confer with said Board of Regents, and aid, so far as possible, the advancement of the objects sought to be attained."

PLANT DEVELOPMENT AND TRAINING.

JONATHAN PERIAM,

President Northern Horticultural Society of Illinois.

In all the departments of agriculture, whether in husbandry, stock-breeding, pomology, gardening, floriculture, arboriculture, and even in landscape gardening, the province of the successful operator is to assist nature in the development of plants or objects for use, or the gratification of the senses. I propose, this evening, to inquire into something of plant development, and the art of so training as to produce the best results with the means at hand. So far as mere development is concerned, we have only to look about us everywhere, where wild forms of our more common fruits, flowers and vegetables are found, and witness for ourselves the wonderful modifications that have been brought about by successful cultivation, through longer or shorter spaces of time, according to the nature of the plant to be operated on, or the skill and care of operators.

It is supposed by many that these changes are sudden. Nevertheless, it is a fact that they are exceedingly slow. We see a seedling fruit, the product of a mass of seedlings, inferior to the present fruits, with perhaps a solitary exception. This, however, assumes a different habit of growth, and as to the fruit, superior perhaps, and yet not so much so but that the expert can often trace its parentage. So, at rare intervals, a twig or branch will sport, and assume variegated leaves, and these, with care, may be perpetuated. On the other hand, under careless treatment or neglect, a variety will, in a short time, revert toward the original type, and in fact soon become worthless for all practical purposes. Now it is not the fact that this change in habit and character is sudden; in fact, it has been going on for a long time, gradually, perhaps, for many years before it has been brought up to, or near, the standard of perfection; often with an accelerating speed, as the years pass, and suddenly, certain conditions having been accomplished, we perhaps see peculiar changes to our ordinary senses, and perhaps startling results.

In vegetables, we may witness certain effects, produced in a single season, and by simple means — compost, high tillage and plenty of moisture with a proper heat for the plant. As a rule, the leaf development is in direct ratio to the root development, and *vice versa;* for one is in almost direct proportion to the other. Take a turnip, for instance. Development there has been in a vastly increased store of material in its fleshy root. Cut a cross section and you can almost, if not really, count the leaves it has borne. It seems as if the base of each leaf had been continued below the crown, and there expanding, had swollen in the most wonderful manner. In the cabbage — belonging to the same class of plants — we see the process reversed; the nutriment has been stored in the leaves above ground. Why? To enable them to perfect growth, another season in the ripening of the seed. This is nature's ultimate end. Man steps in and appropriates it to his own use, at the half way stage. In the asparagus, the same general principle is carried out in a different way. The crown below ground is enlarged, and the spring following, throws up thick stems, if the soil has been rich. Here again man steps in and appropriates it, but at a later stage than the preceding ones. The potato is a good illustration of plants having what may be called a dual existence, in

fact being oviparous and viviparous, inasmuch as it produces seeds, and also young plants, from true buds, in its tubers. In this plant the true fruit, the seed, is not edible; is in fact poisonous to a certain degree. It is the starch, sugar and albuminoids contained in the flesh of the tuber, which is the valuable part. The strawberry plant is still another illustration. It propagates itself both by seed and by runners; the runners in this case forming above ground, striking root and becoming independent plants. Here the seedy fruit is the valuable part. In those cases where propagation takes effect by stolens, runners, or buds, the younglings are true to the parent variety. When propagated from the seed they are widely divergent. Those plants that reproduce themselves by seed, come constant as to their variety, or as a rule do so; those producing themselves by bud and seed, come universally constant from the bud, and vary as to their seed production, and even from the same seed capsule. The onion is a still more complex example in its triune manner of reproduction. The scales of the bulb are simply enlarged leaves, on leaf bases, crowded around a central stem, but each with a possible bud in its axil. Here we have the young plant edible as to its leaves and edible as to its mature bulbs. It is also seed bearing. It reproduces itself as to its central shoot, and there it is a passible plant in the axil of the scales. Some varieties of the onion do provide for perpetuation in this way; as the shallot, the English multiplier and the potato onion.

Trees also are reproduced both from the bud and the seed. Theoretically each bud is the germ of a future tree. It contains a future tree. Practically, in many varieties, it is easier to reproduce plants from seed than from the bud. In fact, if it were not for the singular habit of seed variation, in our valuable fruits long under cultivation, propagation by grafting or budding would scarcely be practiced. Fortunately, this seed variation has given us all that is valuable in fruits, and nearly so in plants and flowers. Within comparatively a few years, science has entered the field of reproduction, and we may now hybridize, and cross breed through the flowers, with far greater certainty of success than formerly.

Soil has much to do with the variations of fruits we may raise. Climate, however, has still more influence. A wide range of soils will allow of the production of many fruits. In Wisconsin I have

observed some curious antagonisms in isothermal lines, or rather, to be more precise, in the belt curves, adapted to some, at least, of the fruits natural to the state. The northern line of pear growth in Wisconsin shows very distinctly the ameliorating effect of deep bodies of water and timber upon the climate, in the cultivation of fruit. This line running down from Green Bay, describes an arc to the south and west, leaving the state well toward the southwest. From thence it is deflected again, west and north, until the belt is at last lost in the Pacific ocean, well north in Oregon. This line is not indeed carried in uniform curved lines, or even moderately curved lines. Sheltered situations, peculiar soils, the vicinity of lakes, protecting bodies of timber, etc., carry it north, and the reverse conditions carry it south. Its northern deflection is undoubtedly due to the great outlying forests, which are well known to have a wonderful effect in modifying and tempering climates. The grape — those varieties possible to cultivate at all — is marked by a line contrary, or nearly so, to that of the pear. Commencing in the southeastern part of the state, it passes north and west toward Duluth, on Lake Superior. Now the same summer temperature that will ripen Dent corn, will ripen the Concord grape. But we have summer temperatures that will ripen the fruit, but the winters of the same locality will kill the vine. Just here comes in the question of winter protection, in the successful development of certain plants. In relation to these fruit belts, we find two prime integers. A lower average summer temperature in the pear belt, and probably a more congenial winter temperature, and a higher summer temperature along the grape belt, and undoubtedly a more severe winter temperature. At all events it is one of more severe fluctuations.

We do not know, shall not, perhaps, soon know, the exact limits of fruit culture, nor how wide may be the distribution of fruits in the west. What we especially need to know is the exact limits, as well as the exact capabilities of localities, and each individual location. Here each person must in a great measure judge for himself. Varieties vary as widely as location, and from the fact that they are influenced and modified by soil exposure and various other influences to which they must necessarily be exposed. From this we may easily see that each individual should not only be a careful reader of literature pertaining to his art and profession —

for agriculture, in its broad sense, is both an art and a profession — but he must be a close observer of nature as well. If to this he add the faculty of investigation and the will to experiment, so much the better for himself, and especially his fellow men.

Time will not permit following this matter further, except to touch some of the points connected with fertilization, breeding to type, cross breeding, and hybridization.

Fertilization is simply giving the power of reproduction, whether it be of a given variety or by the admixture of varieties.

Breeding to type is the endeavor to so order the fertilization that the produce shall follow some given type that may be wanted.

Cross breeding is the bringing together of two individuals of the same genus or tribe, but with distinct characteristics.

A hybrid is the product of two varieties belonging to the same order, but distinct from each other; as, among animals, the horse and the ass, or cattle and buffaloes; or, among plants, two species distantly related. With animals, however, we have nothing to do at present. Plants, as animals, may be hybridized, thus forming distinct families, or they may be cross bred upon those of the same genus; or, the branches of a family may be kept pure and unmixed, if care be taken in the fertilization and selection. This, however, is more the province of the experimenter or seedsman, than the ordinary cultivator. The embryo of a plant being once fertilized with the pollen of the same variety, is thereafter incapable of taking up and assimilating with a kindred variety a beautiful example of the means used by nature to keep families and species distinct.

But nature has gone further. According to Darwin, one of the most persevering, acute and laborious investigators, we have every reason to believe that blossoms upon which the pollen of kindred species have fallen — and the embryo of which would be fertilized thereby, if no other contact were had — have the power of rejecting this, if soon thereafter they receive the pollen of their own individual species. It is also a fact that hybrid species are exceedingly infertile, until, through succeeding generations of care, the characteristics are fixed. In fact, true hybrids are entirely infertile, the exceptions being so rare as to be always occasions of surprise.

Plants have the habit of intermixing in a very variable degree.

Peas, for instance have a prepotent power of their own in a remarkable degree, and hence are not liable to intercross. Cabbages, on the other hand, easily mix, and all cultivators know the difficulty in keeping the cucumber tribe, which include melons and gourds, from intermixing.

In wild species, the tendency to remain constant to a fixed type is well known. In wild plants, one reason is that given varieties usually grow upon soils best adapted to them, and species being prepotent, as we have shown, to their own kind, they remain true. Once the departure takes place, the tendency to sport becomes easier, since the progeny will take their character to a greater or less degree from one of the parents. Thus, a variety once obtained, with care it may be perpetuated and fixed, or still further be modified to suit the will of the experimenter. But to do this, the scientific propagator must in order to modify, and then fix the type, spend years of patient time and care in the breeding, selection and development.

Plants in subjection constantly persist in reverting back to the original species, or else degenerate in regard to their qualities unless the greatest care be taken in cultivation and selection. This habit of reversion, indeed, becomes less and less with each succeeding generation, if care be taken in selection and cultivation; but, on the other hand, where by care and high cultivation the type has become fixed, degeneration is more thoroughly marked through want of care. So, notwithstanding the yearly influx of superior plants and seeds, the want of care in selection and cultivation by the ordinary grower soon carries them back, and with this determination, their places are taken by others, perhaps no better than they once were. So ample scope and profit results to that class who are constantly employed in breeding to type, by crossing and by selection, thus improving the quality of plants and their seeds.

Thus care enables us to breed up and perpetuate those characteristics we wish fixed, and the want of care causes them to retrograde. And this more quickly than they were brought to perfection. If it were not for the law of heredity, the prepotency of fixed types, and the greater or less sterility of hybrids, animals and plants would soon be mixed in inextricable confusion, and, instead of our numerous but fixed species, we should have classes of

monstrosities continually succeeding each other. As it is, through scientific cultivation and perseverance, we are constantly improving and refining both plants and animals.

As a rule, we would not advise the ordinary cultivator to attempt the creation of new sorts. They may do much, however, by cultivation and selection, in keeping varieties not only intact and pure, but in improving the yield and quality. It is better for the farmer and gardener to leave this to those seedsmen whose peculiar province it is to follow this branch of agriculture. With the seed of many of the garden plants in cultivation, which hold their vitality unimpaired for years, the amateur cultivator may retain them pure, by saving seeds of one season planted entirely separate from others of kindred species to be used from year to year so long as they retain their vitality in perfection.

Discouragement has often resulted from not properly studying adaptation to climate and soil. Such tender apples as the Rhode Island greening and Newton pippin will not answer expectations in high latitudes. It is a good plan in buying trees to leave the selection to the nurseryman, if he be competent and trustworthy, advising him of the locality, soil, exposure, etc., that he may choose the sorts accordingly.

Let us now look at some of the forces and elements that go to develop vegetation.

Air, heat, and moisture, are alone necessary to the germination of seeds. Life, air, heat, and moisture, are essential to the growth of the plant above ground, and heat, moisture, and the organic and inorganic constituents of good soils, are absolute requirements necessary to the sustenance of the plant below the surface, by means of the roots.

Plant force is made up of heat, light, electricity, and affinity. The elements of plant light are oxygen, hydrogen, nitrogen, carbon, etc. The nutritious grains, and the deadly vegetable poisons, are made up by forces acting upon the same elements. They are composed, decomposed, recomposed, and acted upon by the forces of nature, in a manner so subtle that many of the processes are beyond our comprehension; and yet, from what we do know, we have every reason to believe that they are all accomplished by processes at once as simple as they are beautiful.

From the rudimentary vegetation of mosses and lichens, strug-

gling for life in crevices and upon branches in the arctic regions, to the towering forests, tangled creepers and brilliant flowers of the tropics, all are brought to life by force acting upon the elements since the time that the earth was cast into the ether fresh from the hand of its Maker. The simple observer of these facts, unaided by chemical knowledge, is lost in the mysteries contained therein, and the elucidation of them to such would be a life-long, and at last, perhaps an impossible task. How is it, then, that plants growing in the same soil, moistened by the same showers, bathed in the same air, and warmed by the rays of the same sun, are so different in their properties and combinations, and develop qualities differing so widely from each other? It is simply force acting upon matter, and is in accordance with fixed laws, emanating from the Creator. The seed is developed into the plant, the plant produces the ripe fruit, the fruit matures the seed, and each of these again may be decomposed into their original elements. Thus the elements, of which the coal measures are formed, the vegetation of the carboniferous age long since past, are now just being given up to the use of man, to be converted into *light*, *heat* and *smoke!* What are they? Only another name for coal, and this again for extinct vegetation, and the latter for that which had preceded it.

There are five stages in plant life — the germination of the seed below ground; the growth of the plant above ground; the development of the flower; the maturation of the fruit, and the decay or death of the plant. In the case of annuals, the first four stages are accomplished in a single season. In biennials two are required, and in some of the perennials — as for instance the mighty monarchs of the forests, as in California and other countries — thousands of years are required. Thus from the ephemeral mushroom, and other *fungi*, which mature their growth and decay in a few days, to some of the aged growths of tropical and semi-tropical forests, an infinite number of generations of the *fungi* must elapse to make up a generation of the others. Yet the same elements compose one as the other. The mushroom becomes food for grass, the grass for the shrub, the shrub for the tree, and the tree, after it has fulfilled its mission, again becomes food for other vegetation. Nothing is lost, only changed, to work and rework out its task in the economy of nature.

Seeds kept absolutely dry do not germinate. If kept from con-

tact with the air, they remain sound indefinitely. In order to the successful germination of seeds, they must be abundantly supplied with moisture, heat, and air. Light is necessary to the development of the plant, but it retards if it does not altogether prevent germination. During the process of germination, seeds absorb oxygen, and give off carbonic acid — that is, a portion of the carbon of the seed is oxidized, and the process of oxidation produces heat. Light produces a contrary effect; it deoxidizes the carbonic acid, or resolves it into its primary elements — carbon and oxygen.

The amount of heat required to germinate seeds, varies with the kind. Wheat, rye, and most of the grasses germinate at a lower temperature than oats, barley, flax and Indian corn. Many of the exotic vegetables cultivated in our gardens, require much heat and moisture to induce germination, and hence, it is usual to start them in hot-beds. They gradually, however, become more hardy, and germinate more kindly after becoming partially acclimated. So plants taken from a cold climate to a warm one, change their constitution somewhat, and after many years if taken back to a colder climate, they will be found to have lost some of their hardiness.

In the process of germination, seeds also actually give off heat, so much so sometimes, if placed in masses, as in malting, to sensibly affect the air. The heating of grain when wet, and laid in piles, is a phenomenon familiar to many. The moisture and heat being right, the grain sprouts, heat is germinated, and the transformation of starch or gum to sugar is effected, by its combination with acid, for during germination, acetic acid and a peculiar substance — diastase — is formed, which has the power of converting starch into sugar. Sugar is carbon, and carbon is necessary to the plant. This had been previously stored up in the seed to support it until it could push forth its plumule and radical — the first rising above ground, and the latter pushing its way below. The first to form leaves, and the latter to draw nourishment held in solution by the moisture of the earth.

The embryo plant is contained in the seed, and may be easily seen by dissection under the microscope. The primary leaves of many seeds, as the legumes, peas, beans, etc., are formed of the two lobes of the seed itself. These rise immediately above ground. In other cases — as in wheat — the seed remains below ground, and is gradually absorbed, ust as the seed-leaves of beans are partially

absorbed above ground. The sugar, however, cannot be converted into woody fibre until after the appearance of the true leaves; hence all plants while in the seed leaf are very succulent. The sugar, by losing some atoms of the elements of water, is converted into woody fibre. Sugar is composed of carbon 12, oxygen 12, hydrogen 12. It becomes woody fibre by losing four atoms of oxygen and four of hydrogen. In the laboratory, nitric acid has the effect to change starch to woody fibre; and since nitrogen exists largely in the air, it is perhaps the effect of the nitrogen which causes sugar to be converted into woody fibre, and it is well known that the effect of dilute acid upon starch is to promote the formation of sugar, or rather glucose.

These, therefore, are some of the more important processes in the transformation and germination of the seed until it has reached the surface of the earth, and put forth its true leaves. From this time forth it enters a new existence, and must depend upon the conditions present in the air and earth for its sustenance and growth. If they are present, the plant increases, matures, becomes an herb, a plant or a tree. If the proper conditions are not present it becomes enfeebled, lingers, and perhaps dies outright. It is the province of the progressive farmer to supply these conditions, so far as he may be able. Many of them are within his reach. He can attend to the drainage of his land, so that the soil does not become saturated with water, for when so saturated air cannot enter, and without air the seed must perish. Without sufficient heat the seed will not germinate. Drained soils are warmer than undrained ones, and without being wet they are always moist. If the soil does not contain water in a free state it will contain air. This air is being constantly decomposed, and in the act of decomposition it gives up its heat to the soil, and heat is one of the necessary conditions of growth.

This brings us to training as a means of development. This may begin in all grafted fruits at the root. Whatever may be thought as to the influence of the scion on the stock, this much is probably certain. The top does produce a notable effect on the root growth, and *vice versa*. Hence the necessity of grafting or budding on stocks having a root growth similar to, or rather corresponding with the top. The pear grafted on the quince, unless allowed to make root above the junction, is very short lived. Why?

One reason is, the quince is a fibrous rooted plant; the pear is not. The pear succeeds well, and in many instances bears fine crops, grafted in the central branches of apple trees. If a due modicum of apple leaves and wood is left to support the root, the pear remains longer than it otherwise would. If not, it soon loses vitality. Why again? The root of the apple is not congenial to the pear, as regards longevity. Grafted upon sections of apple root, and allowed to make roots of its own, above the junction, it is successful, at least so I am informed by Mr. U. B. Spaulding, of Springfield, Illinois, one of the most careful cultivators and successful nurserymen in the state.

In root grafting the apple, it is altogether better that the tree ultimately make roots from its own wood. Thus, each variety of top makes its own particular elaboration of root. All nurserymen know that peculiar topped trees have peculiar roots, and it is well known that the roots of a tree correspond to the top more or less intimately; at least, such is my observation. As a rule, strong and robust tops have strong and robust roots. Trees that rise straight and high have deep roots, while spreading trees are inclined to have superficial roots. Thus, the pear is a deeper rooted tree than the apple, and especially delights in a soil, pretty compact, it is true, but of such a nature that the roots may pierce deep without interference by water. The pear, however, is so peculiar as to soil and location, that it is hardly worth while to spend time in discussing its proper training. It may, however, be stated in general terms, that all training and pruning must be so performed as to preserve the natural habit and characteristics of the tree. The great fault with the average cultivator is, they prune too much. The system of open heads, and severe pruning, was transplanted from the peculiar climate of old England to New England. Hence it came to us. It is only within the last twenty years, that we of the west have found out we were killing our trees by too much pruning. Later, the east has accepted our experience. We have bought our experience dearly. We first learned that it would not do to prune in the west so severely as east, and then they learned that they were better off by accepting the close heads of the west, than with their open umbrella shaped tops. Apple trees should be allowed to grow as close as possible, so the limbs do not abrade each other, and at the same time so that each leaf may get a due modicum of light, according

to the nature and habit of the tree. Another mistake with some otherwise good pomologists is, the idea that the apple may be trained with a straight central stem, with the limbs coming out regularly about it. I have heard it argued before the Horticultural Society of Wisconsin, by a well known pomologist of Illinois, and an able man. It is mere theory that will not bear, successfully, the test of experiment.

The apple is, as to type, a round topped tree, formed on a comparatively short stem. The pine family, including the pine sub family, have tall shafts, with the limbs coming out at regular intervals along the stem from the ground up. By heading back, and persistent labor, you may make a comparatively round topped tree of a pine; but, at the expense of its value. So with persistent labor, you may force some varieties of apples to assume a *quasi* upright growth. The attempt to do either will result in about the same practical value as with a cedar tree I saw in the Japanese Department at the Centennial Exhibition at Philadelphia. It was one hundred years old, three feet high, and rugged and uncouth to a most hideous degree. We must so prune as to preserve the greatest quantity of wood and leaf surface that the habit of the tree will admit. There are three types of trees that may do for illustration. The Perry Russet is thick, compact, a round headed tree Talman Sweet is spreading in its habit. The yellow Bellflower is between the two in habit. The Northern Spy is upright in its growth — decidedly so.

My own practice has always been to manure liberally, raise some early maturing crops in my home orchard — potatoes, early sweet corn, peas — or in lieu of that, some crop that might be plowed under; to prune as little as possible, and assist open-top trees to make closer heads rather than to take anything away. I have seldom found any tree too close, even Northern Spy, which grew quite dense with me, requiring but little thinning, except taking away here and there inside shoots that interfered with each other. I certainly was successful in getting good crops of fruit, even in Cook county, Illinois, a locality not celebrated for fruit orchards. One more point and I have done with this branch. I would rather have anywhere in the west the first fifteen bearing years of an apple orchard, than all which might follow in the life of the orchard thereafter. The rule will apply to any fruit, except in rare loca-

tions. Plant carefully, cultivate thoroughly, and renew often. One year, or two, from the root-graft, according to growth, I would cut back to where I wanted the head to form; nurse the branches that come out below the heading back as much as possible; never allow crotches to form, and prune to keep the head as compact as possible.

Currants and gooseberries I would plant on rich soil, and give them compost manure under them besides. Never train them into tree form. As soon as they cease to bear full crops of large fruit, root them out, and plant again. All the pruning necessary is to take out old wood. The first four or five crops are the profitable ones.

Strawberries I would never allow to make runners, whatever the variety. It costs too much to keep them clean, and for picking the berries. I want but two crops before renewal. It is true, here we are going constantly against nature, but the short life we give the stools fully justifies the means.

Raspberries I would top at a height not exceeding three feet, and allow the laterals to grow at will. The succeeding spring clip these close enough to allow the pickers to work easily. Give the same treatment to blackberries, except they may be allowed to make more upward growth before cutting back.

The system that I have found most successful with grapes, is to raise a good strong single cane to a height of six feet, and then pinch off. After the laterals have made one bud, I pinch beyond. After this bud has made another, I pinch again, and so once more, and then allow it to make what growth it will beyond. It will seldom be much. I cover the canes in the winter. Early in the spring I uncover, allowing the vines to lie along the ground until the buds show strong signs of breaking. Then tie them to single stakes. I have not found it practical always to raise a cane for fruiting the next year, while the vine is bearing a full crop the present year. I try to keep the vines into as compact shape, and as near the ground as possible, until some year when the blossoms are killed, and then start anew. I could better afford to lose one crop out of three or four, than to bother with old, ragged vines. While the crop is growing I prune but little; simply pinch the ends to keep them tolerably compact. Before covering in winter they are pruned so as to leave a good quantity of bearing wood for

the next year. I had rather have the first four or five crops of a bearing vineyard than the succeeding ten, without cutting back.

I have been asked to say something about the home grounds, and development, in their ornamentation. It will be impossible in the limits of a single lecture to even go over the ground lightly. Angular or spiral topped trees should not be planted when the roadways and walks are in gently curved lines, as they should be. If it be necessary to make an abrupt turn, plant it in such a way that it may seem as little abrupt as possible, and in such a way as to bring out some new object of beauty beyond. The great mistake is in planting too thick, so that in the end the place becomes a ragged wilderness. Even those who plant thick, for immediate effect, with a view of thinning in time, rarely accomplish their object — we so hate to cut away that which is beautiful for the time being. Procrastination here is not only a thief, but an absolute murderer.

The beauty of any home grounds is in its lawn. You cannot have too much of it, nor have it too good. It is difficult enough, at best, to keep, in our climate. If the individual have the taste and time, or the means, it is labor well spent. The study it gives, from time to time, in becoming familiar with the peculiarities and habits of the various trees, shrubs and flowers, will not only expand and broaden the mind, but lead nearer and nearer to the Supreme in the contemplation of the wonderful beauty and exquisite finish of God's natural objects. We will soon come to know that we must not severely cut back a lilac, else it will be deprived of the chief beauty that the Creator has given it. One will soon find that he may not attempt to make a tree of the spirea. The lilac may indeed be trained into the shape of a beautiful dwarf tree; the spirea must always remain a bush, sufficiently elegant in its lithe, rod-like shoots, crowded as they are with pure and lovely clusters of bloom.

Mr. Chairman: I have so far been dealing with the practical. I fear I have detained you too long. A few words more and I have done. Let us look at the esthetics. Mahomet has said:

"He who planteth a tree watereth the earth."

Bryant's forest hymn breathes out:—

"The groves were God's first temples."

Two sublime thoughts — one from a heathen, the other from a Christian source. The oak standing alone,

"Waves its giant arms athwart the sky."

In the grove we find

"All meek things;
All that need home and covert, love the shade!
Birds, of shy song, and low-voiced, quiet springs,
And nun-like violets by the mind betrayed."
The "Honied lime,
Showers cool, green light o'er banks where flowers weave
Thick tapestry; and woodbine tendrils climb
Up the brown oak, and buds of moss and thyme —
And the white poplar, from its foliage hoar,
Scatters forth gleams like moonlight, with each gale
That sweeps the boughs."

Our civilization seems to be carrying us further and further toward the artificial. We are too apt to discuss and run after fine-spun theories, even in the cultivation of our soil, the planting of an orchard, the adornment of our homes, and the development, by training, of our trees and plants. It is well to come back to the natural once in a while, and observe how nature does her work. She has made the oak, standing alone on the landscape, to spread its sturdy arms widely, bidding defiance to the blast; or, in the deep forest, to carry its shaft up, up, with a green canopy of leaves at the top. We may take a lesson here in natural development, and profit by it. The elm with its noble trunk, and its lithe pendulous branches swinging in the breeze, may not be cut into rigid form, nor the oak be made to put on an aspect of sweeping grace and beauty. Cone bearing trees may not be decapitated, except to their ruin, unless we want them for low growing wind breaks. The tulip tree, if it, at last, do not carry its top well above the oaks and walnuts, has been planted in vain. So we must know whether we plant for ornament or utility, or both. If for ornament, let us select some at least, hardy as to latitude, but exotic as to locality — not forgetting our noble elms, maples, walnuts, lindens and tulip trees. Let us not forget that there is profit, as there is pleasure, in the development of an orchard and a vegetable garden. Let us not forget that a few beds of flowers, cut here and there in the

lawn, will develop beauty and profitable pleasure with each succeeding year. Let us not forget that the plats of flowers, few though they may be, in our living room or beside a window, or in the greenery in winter, may give us profitable pastime in their elegant and variegated, or unique foliage or habit, and in the delicate and pure breath of perfume we get, when all outside is locked in frost, or buried in snow. We may plant groves and wind breaks, where we have them not. They will give us cool fragrance in summer, and in the autumn gleam with their wonderful tints of crimson, and purple, and gold. Costly monuments have been erected to warriors, whose only glory was that of having caused the death of thousands of their fellow men, in an eager thirst for power. Obelisks have been reared to tyrants, who have founded empires upon the blood and the wreck of the lives of their subjects. Temples have been built to mammon, and the poor pride of the founders have sought to perpetuate their names upon engraved tablets, contained therein. The man who has planted trees and other beautiful objects about his homestead, unconsciously, perhaps, is rearing the most enduring and noble tribute to his memory of all, and with this added consolation: The weary wayfarer, resting beneath their shade, in the far future, perhaps, when the bones of the planter have long since became as dust, will, as unconsciously, bless those who have tended these trees. In their tops the twittering birds will pour out peans, and the winds murmuring among their leaves, will whisper of the benefactor who sleeps the sleep of the dead, or swelling with increasing volume, bear aloft a jubilant anthem, which rising in the heavens, will reach Deity himself. Monuments may crumble and fall; obelisks may be thrown prone in the dust; famed temples may be given as hiding places for serpents and bats and owls. A civilization may decay, and become a thing of the past. Trees will grow, and wax greater and greater, and rear their glorious heads toward heaven, and perhaps some future poet, of some future civilization, may sing of them, as our own poet Hempstead sang of the mammoth trees of California:

"They were green when in the rushes lay and moaned the Hebrew child,
They were growing when the granite of the pyramids was piled;
Green when Punic hosts at Cannae bound the victor's gory sheaves,
And the grim and mangled Romans lay around like autumn leaves;

From their tops the crow was calling when the streets of Rome were grass
And the brave Three Hundred with their bodies blocked the rocky Pass;
In their boughs the owl was hooting when upon the Hill of Mars
Paul rang out the coming Judgment, pointing upward to the stars;
Here, with loving hand transplanted, in the noonday breeze they wave,
And by night in silent seas of silver-arrowed moonbeams lave."

PLEA FOR STATE AID.

J. S. STICKNEY, WAUWATOSA.

Let us briefly consider the past work, the present condition and standing, the responsibility and needs for the future of our State Horticultural Society. We will not go back to its early history and work, but only about ten years, when after the war it re-organized, and went earnestly at work to stimulate and awaken a more active interest in tree planting and fruit production; to encourage to new efforts those who had suffered so terribly from severity of climate, or who had been led widely wrong by selfish and irresponsible advisers.

Ten years of this persistent earnest effort may be summed up as follows: In all reasonably favorable locations we find orchards, producing more or less of fruit, some of them models in their way, and all reasonably prosperous. They are not found on *every* farm, only on a few; yet enough to serve as stimulating examples to others. In every town and village the markets are fairly supplied with all the small fruits in their season; not all that *should* be consumed, but enough to illustrate their excellence and to cultivate a growing demand for more. In our large towns, public squares and parks are receiving attention, cemeteries are being tastefully planned, and more or less of planting done. Around many dwellings are beautiful groups of trees, and scattered here and there over the broad prairies, in front of the farmer's dwelling, are the two, four, or possibly ten evergreens, usually arranged in formal rows, the advance lines of the *hosts* that are *surely coming* to group themselves about these same homes, adding winter beauty, warmth and sunshine thereto; and to stand on the west and the north of these farms in unbroken lines, giving most grateful shelter to domestic animals, and to the now bleak and wind-swept fields.

That this growing taste and desire for the pure and the beautiful reaches all, may be seen in the bit of velvet green on the small city lot, or the single vine growing in space too limited for aught beside; or the few blooming plants in the sunny window of the most humble cottage.

As most beautiful and convincing proofs of progress, we point with pride to *Horticultural Hall* at our state fairs — 2,000 square feet of table room, well filled in years of scarcity, and in years of plenty crowded and heaped up with luscious and magnificent fruits. Truly this is a pleasing picture for all, and in its production *all have been co-workers;* but to the members of the Horticultural Society, who have regarded this as their especial work and mission, this measure of success is peculiarly gratifying. It has cost us hard work; it has cost us years of time and no small amount of money, all of which it has been a pleasure for us to give.

This hasty glance at successful progress may convey the impression that *full* success is now assured; that the battle is fought and further effort unnecessary; but to this bright picture there is another side. The truth is, our work is *only commenced*, and that its rapidly accumulating wants and requirements are passing beyond our *individual means* and *unaided strength.* As a state, where we have *one* orchard we need ten or twenty. For every family using the small fruits *freely*, there are twenty to whom their liberal use is unknown. In locations where the larger fruits fail, the culture and use of these smaller fruits may and *must* be made to fill their place. In the adornment of cemeteries and parks, it costs little more to make them models of landscape planting instead of what they now are. Instead of the lonesome and scattered evergreens of to-day we must *multiply them by thousands.* Our occasional green lawn or show of window plants we would make the *rule* instead of the *exception*, and would plant a vine or a blooming shrub *everywhere.*

To prove that these things are not only desirable but *vastly profitable*, please each one take some familiar farm or home; strip it of all these adornments; then invest it with an average amount of the same; then clothe it with all the luxurious comfort and happiness that you believe these things may bring to it, and make your own estimate of its different values in the three conditions from the standpoint of true happiness and of dollars and cents.

For the purpose of convincing argument, I am willing to leave these comparative figures with each of you.

This, then, is our work for the future. To do this work we have only a little band of earnest workers. We have to-day in our treasury, nothing. We have as auxiliaries some ten local societies, from many of whom our only communication has been a report of their annual election and a list of their officers.

The state kindly places in our hands annually 1,000 volumes (restricted to 200 pages) of our transactions. These volumes we prize as treasures, and no other means have done so much to help on our good work. Their size and number could be doubled, and every page and every volume be profitably used. Whatever other strength or influence we may have must be wholly due to the manifest unselfishness of our work, and to the candor and truthfulness of our teaching.

And now to the legislators present I wish to bring this question: *Are the means in our hands equal to the work to be done?* If you decide that they are, we must still work on, making the most of what we have. If you believe in the importance of our work, and if the discharge of our former duties gives you faith in our future, we ask your favorable consideration of a bill to come before you in our behalf. We do not ask it in the light of a favor to ourselves, but as a means for the promotion of one of the most noble and valuable industrial interests of our state.

I will briefly indicate some of the larger and broader work which an appropriation would enable us to do.

It would help us to organize more local societies, and to maintain more intimate relations with those already organized, thereby stimulating them to greater exertions and the accomplishment of greater good.

Interest in our summer and winter meetings could be largely increased by a small premium list for each; thus, in summer, reaching and developing a variety of horticultural products which are out of season and lost to our fall exhibition. Special premiums for orchard planting, timber planting and ornamental planting would largely stimulate these interests.

Means are needed for special work in developing, providing and disseminating new and valuable fruits. Notable among these are two hundred or more Russian fruits now being tested.

These are some of the helps that an appropriation would place in our hands.

Iowa annually gives her Horticultural Society $1,000; Illinois $4,000; Michigan $2,500.

Minnesota has purchased 116 acres of land, and appropriated $1,000 annually, for the purpose of originating, testing and disseminating trees and fruits especially adapted to her wants.

These are the views, and this the action of our four surrounding sister states. It only remains for us to fall hopelessly behind, or to ask for and receive aid at your hands; consequently we make this request with enthusiastic love and zeal for our calling, with full belief that our state resources and interests are *second to none*, and that every dollar expended will return to her an hundred fold.

INSECTS INJURIOUS TO THE APPLE AND GRAPE.

DR. P. H. HOY, RACINE.

Officers and Members of the Wisconsin Horticultural Society: I come before you by invitation to speak of some of those insects that are injurious to agriculture and horticulture, more especially those infesting the apple and grape. I shall speak only of those insects which I have in these cases before me, brought that you might examine them at your pleasure.

Although good engravings are of great value, yet, if they were ever so accurately executed, they would still fall far short of the reality. I, therefore, will not describe the perfect insect, but call your attention to these specimens, which are conspicuously labeled and so arranged that you can distinguish them at a glance.

FOES TO APPLE.

The American Lappet Moth, *Gastropacha Americana*. The food plant of this moth is the apple tree, on the leaves of which the larvæ feed. Where the eggs are deposited, and just how long they exist in the larval state, is unknown. The life history of this moth remains to be studied. The caterpillar, when fully grown, measures two and a half by one-half inches. The upper part is gray, variegated by irregular white spots, and ornamented with

two conspicuous scarlet bands on the second and third rings, and on each of these bands there is a black dot. They have warts projecting from their sides, covered with gray hairs, some of which are tipped with white knobs. These hairy lateral warts look somewhat like lappets, hence the name Lappet moth. The underside of the worm is ornamented with a row of diamond shaped black spots. These caterpillars feed only at night and remain at rest during the day, stretched out on the limbs motionless, in which position they are hard to see. The moth which I exhibit is a male; the female is at least twice as large. This is a rare insect in the eastern states, but if I am not greatly mistaken, it will prove to be entirely too abundant in Wisconsin.

The apple tree Tent moth, *Clisocampa Americana*. The Tent caterpillar is so well known that a description is hardly necessary. The shining tent, constructed by the united labor of all, is so conspicuous that no one is deserving of pity who will permit his orchard to be overrun and destroyed by these pests. A light step-ladder and a stout pair of gloves are the best implements to combat this enemy. Before nine in the morning or after four in the afternoon, you will always find them at home snugly housed, or rather tented. The eggs, deposited near the end of the small branches, are so easy to see, that with care, any time in the winter or early spring, these egg masses can be gathered and destroyed, thus nipping them literally in the bud. I exhibit the egg masses; they contain from 300 to 400 eggs each.

There is another closely allied species —*Clisocampa Sylvatica*— which is generally confined to the forest, yet, in exceptional cases, they have been found in the orchard. This species can readily be known by the dorsal stripe on the caterpillar. This stripe is continuous, of uniform width, while in the forest species each ring has an exclamation point on it, or as one has said, a " ten pin." Perhaps the individual was more familiar with ten pins than the more literary character. Harris, Fitch and Riley may be consulted for a more detailed description.

We have two species of canker-worm infesting the apple tree— the fall canker-worm, *Anisopteryx autumnata*, and the spring canker-worm, *Anisopteryx vernata*. These two species of geometers do great damage to our apple orchards. The females are without wings and hence we have more control over them. Not

only the vernal species come out in the spring, but numbers of the autumnal species are delayed till the warm days in March or the first of April. The larva is a ten-legged looper, pale green to brown, with narrow stripes of yellow. All we have to do to control these canker-worms is to devise means to prevent the female from crawling up the trunks of the trees to deposit her eggs. Many devices have been invented, and many of these, if used understandingly, will prove successful.

As all these worms must go into the ground in order to undergo their metamorphosis, and as the female is wingless, we can have perfect control of them. Adhesive mixtures put on the trunks, wisps of cotton batting or any other fine fibrous substance suitable to entrap these creeping nuisances, will generally be effective.

The yellow-necked apple-tree worm, *Datana ministria.* Few worms excite more alarm than do these large caterpillars, as they live together in families. They commence eating at the extremity of the branch and devour every green thing as they descend. When feeding, they huddle together on the under surface of the leaves, with their heads all one way. The moth begins to appear the last of July. The eggs are deposited in one pack on the under side of the leaf. The larvæ are plump and covered with soft hairs. The first segment (neck) is marked with a pale yellow band. The upper side of the worm has narrow double dorsal and four narrow lateral cream colored stripes; head black, without spots. The yellow neck will sufficiently distinguish these large worms. May their number be small.

Tussock Moth, *Orygia leucostigma.* During the winter little bunches of dead leaves are frequently seen fastened together on our orchard trees, apple, etc. These are the cocoons having egg masses fastened to their sides. These eggs hatch about the middle of May and the curiously beautiful tufted caterpillar commences his work, never in company, singly, but never profitably to the horticulturist. The larva is ornamented with four dorsal tufts on the third, fourth, fifth and sixth rings. A single bunch of long black graduated hairs spring from the tail and two similar ones from the first segment. On each side there is a series of colored spots ornamented with hairs. Those worms that are to produce females go through one more molt than those that are destined to produce males. Although the females are without wings, we have

not quite so much control as we would if the transformation took place in the ground. Still, with care in destroying the eggs, we may limit their injury within reasonable bounds.

Catocala nuptalis and *catocala ultronia.* I have found the larvæ of these two species of catocalas on the apple tree. I never caught them feeding, hence I suppose they feed only at night. These caterpillars stretched out at full length, resemble so closely the twigs to which they adhere, that it is extremely difficult to see them. We have taken at Racine 43 species of these large showy noctuiadæ. They feed on the leaves of various trees, hickory, oak, willow, poplar, etc.

Codling moth, *Carpocapsa pomonella.* So much has been written about the life history of this destroyer of the democratic apple that I will only refer you to the writings of Harris, Fitch and Riley for any wished for information.

Apple leaf crumpler, *Phloxopteris nubeculana.* This specie of Tortrix proves to be a serious pest in many sections, and from their small size and the manner of their operations we have less control than over larger and more conspicuous insects. Each worm works for himself, sews two or three leaves together to serve as a protection against enemies; but although alone, there are quite enough neighbors close by. It is generally true that the smaller the insect, the more the injury. They make up in numbers what they lack in size. There are several other species of *Tortricidæ* found in the orchard, but their injury is of small account when compared with the leaf roller. I intend to study this insect carefully, and experiment with various devices looking to their destruction.

The apple tree borer, *Saperda bivittata.* It is a fortunate thing that this borer should be so rare in Wisconsin. It belongs to the longicorn beetles, all of which bore into trees and shrubs, or rather the larvæ do. You all know the locust clytus that has nearly exterminated this tree at Racine at least.

I have 50 species of these capricorn beetles, all taken in Wisconsin. One of the handsomest of these insects is the *maple borer.*

New York curculio, *Ithycerus novebaracensis.* This large species of curculio does not escape the bad reputation of the entire family. Some years this insect is quite numerous, doing considerable damage to young apple trees. They girdle the small branches at night and hide away under clods and rubbish near the foot of the tree

during the day. I have had many letters with specimens of this, sent for information. Last fall, just at twilight, I discovered a New York curculio at her work. I watched her till she had completely girdled the terminal shoot of a young apple tree.

In this connection I will call your attention to the plum curculio. There are many species of curculio, all more or less injurious, but this rascal bears off the palm. There were none at Racine previous to 1856.

Bupestris femorata. This works not a little injury to the apple. The Bupestridæ are borers, but they always select a spot where the bark is slightly loose, in the crevices of which they deposit their eggs. The young, when hatched, soon penetrate the wood and live there during their larval state. Apple trees are so weakened by their perforations, that they soon yield to the wind. If the decay hastened by these insects does not prove fatal to the tree it affords a happy hunting ground where hundreds of Bupestridæ join forces. Union is strength, but not for the poor tree, which soon succumbs to numbers. Many apple trees are lost, the owner having no idea of the cause. A little Paris green might save the trees if properly used.

The gray Xylina, *Xylina cinera*, appears to be a general feeder. It is frequently found on the apple tree according to Riley, who first described the abundant western species. It not frequently bores into the fruit; apple, plum, peach, etc. The larvæ may be known by a narrow dorsal and a wide lateral colored stripe, color shining green. This species may prove decidedly injurious to Wisconsin.

The Dagger moth, *acronyctia.* The larvæ may readily be known by their long, soft, light colored hairs that project directly from the body, and about five long, black pointed tufts which project outwards, somewhat like daggers — hence the name. The species which I bring is the *acronyctia superans.* I have repeatedly taken this species in orchards, and I am not without suspicion that the larvæ feed on the apple.

FOES OF GRAPE.

Eudryas grata and *unio.* Two species of wood-nymphs and the spotted forester, *Alypia octomaculata*, feed upon the grape,

and it takes more than a superficial examination to detect a difference in the larvae. These are known as blue caterpillars. They have four to six transverse black stripes on each segment, resemble somewhat the larvæ of the Sphingidæ, in fact they were included in this group by the older entomologists. Now they are placed in the small group Zyganidæ. Grape leaf crumpler, *Desmia maculàta*, is a great pest in the vinery. With me it has been more numerous in the cold grapery. They sew together grape leaves and have the general habits of the leaf eating *Tortricidæ*. The larvæ are pale green, marked with transverse wrinkles.

Petrofora diversilineata. A rather handsome geometer that has given me much trouble not only with my hardy grapes but particularly in the cold grapery — under glass. The larvæ when at rest during the day, stand stretched up at about the same angle of the branches and leaves; this together with the fact that in color and general appearance they closely resemble the branch or leaf on which they are fixed, makes an experienced as well as sharp eye necessary to detect them. I fear this insect is likely to prove a great pest in this state.

The arctias is represented by *Arctia Isabella*. The larvæ of the arctia are called hedge-hog caterpillars. They are entirely covered with bunches of rather stiff hairs. These hairs are black, for one-fourth at each end, and bay in the middle of the body. They feed mostly on herbaceous plants, but frequently ascend grape vines and make themselves at home to our cost.

The Virgin moth, *Spilosoma Virginica*. The larva of this moth is known as the yellow bear. They are a general feeder but have a partiality for the grape. They appear to like the warm sunshine of the cold grapery. They deposit their eggs on the under side of the leaves, and in a few days a host of little hairy caterpillars are feeding as if their lives depended on making good time.

Drapsia Miron. This species of sphinx, one of our worst enemies, selects the grape as the food plant for their young. The larvæ have a well defined caudal horn.

Thyrens Abottii is also a grape feeder. The larva has an eye-like spot on the rump in place of the usual horn of most of the Sphyngidæ.

Philampelius pandorus and *P. achemon* usually prefer the ampelopsis, but by no means despise the grape. I have known them to strip a grape vine of its leaves in a few days. They can

be detected in their work if we heed the castings which are conspicuous under the infested vine.

The Bee moth, *Gellerea cereana.* Too well known wherever the bee is propagated. I need not describe.

Bee killer, *Trupanea apivora.* This species of the Asalas family preys on various insects. This species is rather fond of bees. This one captured a bee that was quietly sucking a white clover blossom. The killer seized the bee by the neck and by elevating the abdomen kept clear of the bee's business end. The struggle was short. The head of the bee was severed and the body quietly devoured. I noticed that the honey stomach was a tid bit to this hairy murderer.

The Gooseberry moth, *Euphanersa mendica.* This moth feeds principally on the leaves of the wild gooseberry, but I have known them to infest Houghton seedling.

Synchlora rubivoraria. This little pale-green geometer is the parent of the raspberry worm, so annoying to the lovers of this excellent fruit. The larvæ attach particles of the fruit to their bodies and rolled up in a ball exceedingly hard to see. Without the greatest care we are in danger of eating these disgusting worms with our dessert.

I have here two species of Pieris, *P. protodice* and *P. oleracea.* The protodice has a bad record with the growers of cabbage. The larva may be described as a soft bluish-green worm with four longitudinal yellow stripes. Length one and one-fourth inches. The sixth, seventh and eighth ring are largest, giving the worm a fusiform shape.

Pieris oleracea is abundant at Racine, occurs but little south. The first made their appearance at Racine in 1855, since which time they have greatly increased. The larvæ feed on almost any crusifera. Mustard is a favorite food plant. The turnip suffers considerably from this pest. The larva resembles the protodice, but is lighter colored.

Plusia brassicæ does some damage to the cabbage, still it is quite a general feeder. I have seen it on the tomato. The larvæ are pale-green and almost diaphanous. They are tender and can be destroyed easily, but it takes sharp eyes to see them.

Cabbage tenia, *Pleutella limbipenella*, is small in size but large in damage. Cabbage infested by the larvæ of this small tenia look

as if riddled by shot. It has cost hundreds of dollars in the vicinity of Racine. There is another pest of the cabbage belonging to Dipteria, *Anthomyia brassicæ*, the maggot of which eat the stalk and root, utterly destroying them. Cabbage cut worm, *Agrotis saucia*, destroys cabbage by the wholesale.

The history of insects, their metamorphosis, habits, relation to plants, etc., is a branch of natural history which has peculiar claims on agriculture and horticulture. In view of the millions of dollars annually lost to the state by the depredations of insects, it becomes an interesting problem how to distinguish in all stages of growth our insect friends from our insect foes, that we may be better fitted to protect the one and destroy the other. We are literally at the mercy of insects. Wisconsin can ill afford to do without the valuable services of an energetic, capable state entomologist.

We have a host of insects peculiarly destructive, waiting for careful study, the better to enable us to counteract their evil work. Not the least of the advantages to be derived from the labors of an active, enthusiastic entomologist, is the education of farmers and their families by personal acquaintance. Children would soon learn to see, with their young eyes, what the older ones overlook, and just here is important matter of education. I am convinced that children should be taught natural history as one of the primary branches. I would not have them study printed books, but go to the source where the most valuable information is derived — from the book of Nature, whose pages are ever open wide to the seeker after knowledge.

It is a disgrace that the agricultural interest of the state, which is the foundation of national prosperity, should be so shamefully neglected under the pretext of economy. If an individual owned and cultivated a single township of land, it would be to his interest to employ constantly an entomologist. It can be proven that the money expended for this purpose would return an hundred fold.

The present population of Wisconsin is at least 1,250,000; $3,000 would pay an entomologist. This amount would be less than one-fourth of one cent for each; some of the rich might have to pay ten cents. How frightful this amount looks!

The agricultural and horticultural interests of the state demand more attention and better representation. If our merchants lost a fraction of what our farmers annually lose by insect depredations

alone, they would immediately seek and undoubtedly obtain adequate protection for the reason that they are united, and would see to it that the relief be granted. Let the farmers unite and their interests also will be looked after.

Mr. Peffer — Have you the blue grape beetle? It is a kind of a flea beetle that attacks the grape vine in the spring, eating the buds.

Dr. Hoy — I have not. There are three or four kinds of these little insects, but I have not specimens with me, and thought best not to say anything about them, not being able to show the insects.

Mr. Peffer — They have done more injury to my grapes this spring than ever before. I believe I was the first one that sent them to an entomologist, and that was, I think, twenty years ago.

Mr. Plumb — Some of the gentlemen present have been examining this model of a curculio catcher that was sent here. Give us your opinion on that.

Dr. Hoy — The curculios can fly as well as a bird, and no curculio catcher of this kind will prevent their getting on the trees at all. They raise their hard wings and unfold beautiful little membranous wings under them. Any device of this kind only shows the ignorance of the designer.

Mr. Plumb — I brought this up because the designer of this catcher is a very intelligent man and is laboring under a great mistake. He sent this model to explain his theory of preventing the curculio beetle getting on to the plum trees to deposit its eggs.

Dr. Hoy — He has seen the curculio but has not been able to see its wings; but neither can he see the wings of any of the beetles. They can fly as well as a bird. The curculio never crawls up the tree; he flies up.

Mr. Robbins — I feel very much interested in this lecture on entomology. It strikes me very forcibly. I know the fellows now that do the damage. Now the question is, what am I going to do about it. I do not want any of those animals let loose in my neighborhood.

Dr. Hoy — I have got them under glass.

Mr. Robbins — I want him to kill every one he gets hold of. I have a few apples and grapes and raspberries and blackberries. I do not want any of those animals let loose among them. I am like the boy that was bit by a chipmunk. Says he, "I am glad you bit

me because now I know where you are." I know their names now. I have learned that much. But the question is, what am I going to do about it?

Dr. Hoy — I will ask any gentlemen present to send me any worms that they find injuring their crops or the forests about them. Put them into a little tight box. There is no necessity for any holes. Put in some of the plant or the leaves you find them on. Holes are of no use, but are injurious because of the evaporation of the plant. The insects would be very easily destroyed if they were so tender you had to furnish them air, but they are very tenacious of life.

Mr. Robbins — How are we going to kill them? That is the question.

Dr. Hoy — That is a question the farmers ought to be better instructed upon. We must understand their habits before we can manage them. We see such ignorance as that "catcher," thinking the curculio climb up the tree. If that was so we would have saved our plums long ago.

Mr. Robbins — He thinks he has found out how.

Dr. Hoy — There is that difference between wisdom and happiness. The man that thinks himself the happiest is the happiest, but the man that thinks himself the wisest is not always so. In sending insects put them in boxes and tie with a string, and mark on the outside "Samples of Natural History." The postage only costs a cent an ounce. A cent will pay for a pretty good lot of worms. Address "Dr. P. R. Hoy, Sr.," Racine, Wis., for there are two Dr. Hoys in Racine. I will be very happy to correspond with you and give information, and answer such questions as you may propound. I think in a great many instances people have been destroying their best friends, supposing them to be enemies. A man in Racine went to my son and told him his plum trees were overrun with a sort of bug or worm that runs upon the bark; he had killed thousands and thousands of them. He told me, and I said "They may be beneficial to your plum trees." He brought some to me, and they were the young of what is called the "lady-bug." The trees had been infested with plant-lice, and they had been up and entirely destroyed the plant-lice and came down on the body preparatory to undergoing the change to come out as those beauti-

ful little beetles, our best friends. That is the way he rewarded them for their services.

Mr. Kellogg — I am glad to have this subject so well simplified as we have to-day. I think it is the finest entomological talk we have ever had. It brings the matter right before us in common language. I wish you would describe the lady-bug as it is before it gets to be a lady-bug, so we will not destroy it. As to the box you speak of, will any little pasteboard box do to send specimens in?

Dr. Hoy — The pasteboard box is not very good. They used to make a kind of matchbox of wood which is good. The pasteboard box is apt to get mashed up. A small tin box is good.

Mr. Kellogg — I want to ask the best methods, or whether there is any way to catch the codling moth by sweetened water or vinegar, or in any way.

Dr. Hoy — A great many insects can be caught in large quantities by taking stale beer and sugar, and plastering it upon the side of the tree; just after night if you go there, the tree will be perfectly covered with them, and you can destroy them; by killing the parents you very frequently prevent the propagation of the insects.

Mr. Plumb — The greatest terror there is to the apple tree planter, as a member of the assembly from Green county told me last evening, is the canker worm. He said they were sweeping all through the township where he lives. Said I, "Don't you know it is easier to destroy them than it is the potato bug." No, he did not know anything about it. Everywhere I go I find people who are letting the canker work sweep over their orchards, destroying thousands and tens of thousands of dollars worth of valuable property, when they are much easier destroyed with Paris green or arsenic than the potato bug is. One pound of arsenic which can be bought for five cents, will poison eighty gallons of water, that can be distributed with very little labor over an orchard. Two or three cents worth of that poisoned water thrown from a force pump will completely eradicate the canker worm, in its earliest stages, from a tree able to bear eight or ten bushels of apples. It is a practical remedy. It has been told here before, and yet people do not know it. Now the question with me is, how far can we go with these poisonous remedies. That is to me a subject of grave

inquiry. I am glad we have had so much entomology; we could easily spend the whole forenoon on this subject.

Prof. Daniells — I would like to inquire if that solution would kill the curculio on the plum.

Dr. Hoy — It would be dangerous to the plum, for the poison would be on the plum. It does not hurt the tree or the foliage.

Prof. Daniells — It has been suggested to sprinkle the foliage when it was wet, with Paris green and flour.

Dr. Hoy — There is no trouble about that. There is no danger whatever.

On motion of Mr. Kellogg, the thanks of the convention were given to Dr. Hoy for his able presentation of the subject of entomology.

Mr. Phillips then offered the following resolution:

Whereas, Destructive insects seem to be increasing throughout the state and promise to be more annoying to horticulturists in the future than in the past; and,

Whereas, It is desirable that information upon this subject be placed within the reach of the largest number possible the coming season; and,

Whereas, The press of the state is the most efficient and practical remedy for the purpose; therefore,

Resolved, That the secretary of the Horticultural Society be instructed to prepare at the proper time, short, practical directions for preventing the ravages and the increase of destructive insects, and present it to the press, with the request of the society that all state papers will copy.

The resolution was adopted.

TRAINING AND PRUNING THE GRAPE VINE.

C. H. GREENMAN, Wauwatosa.

President Smith requested me to prepare a paper for the summer meeting, on "Grapes for the common farmer." I managed to get out of writing it by saying that I had nothing new upon that subject. In conversation with him at the State Fair, I stated that I was not quite satisfied with directions and illustrations for training and pruning the grape vine, as published in our last report. He

replied: "That is just what you want to do; write a paper for the winter meeting, and illustrate that subject to your own satisfaction." This is my apology for calling your attention to the subject at this time.

There are a number of things requisite for the successful cultivation of grapes. Training and pruning are indispensable; where this is neglected, failure is almost sure to follow. No vineyard will long continue to yield good crops of fruit without thorough cultivation. It is difficult to do this when the vines are trained upon the ordinary trellis. Staking does much better in this respect, but I find it difficult to prune them properly, and it usually

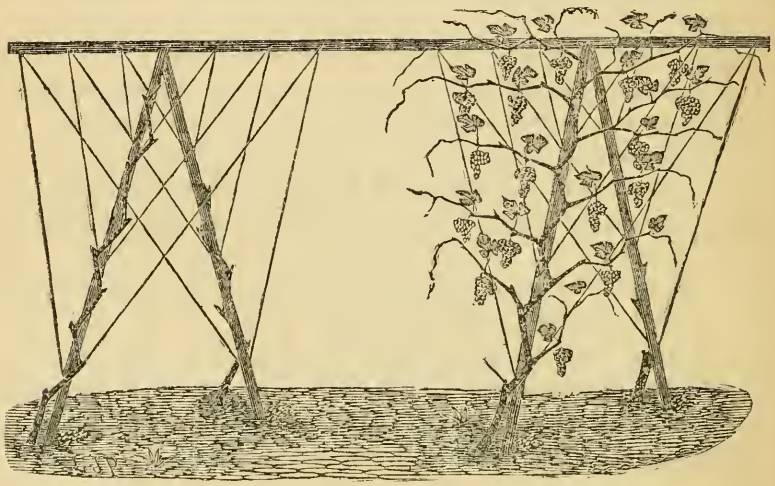


Fig. 1. Vine pruned at close of third season.

Fig. 2. Vine fruiting, the fourth season.

leads to the adoption of the annual renewal system of pruning. Practical grape growers do not regard this as the best system, for they find that the largest and most perfect bunches of fruit are produced on the shoots from wood of more than one year's growth. I have perfected a system of training which combines all the advantages of the stake system as well as that of the common trellis, and at the same time is not subject to the objections of either. Experience has demonstrated the necessity of cultivating the soil, keeping the surface loose and friable, with the rows arranged so that the sun may shine upon the ground to a good degree. When he vines are trained upon the common trellis, running east and west, the vines receive their share of the sunshine, while the soil

is much shaded. The system of training as shown in the accompanying engravings, has the following advantages: The vines are exposed to the light; the sun will shine upon every square foot of soil some time during the day, and the freest circulation is secured, without which mildew would be likely to follow. The angle at which the vines are placed will give them more sunlight than can be secured upon any upright trellis. This trellis is sufficiently high to enable the horse to pass under the ridge, in cultivating the vines. My own vineyard is planted in rows about eight feet apart, running north and south, and the vines six feet apart in the rows.

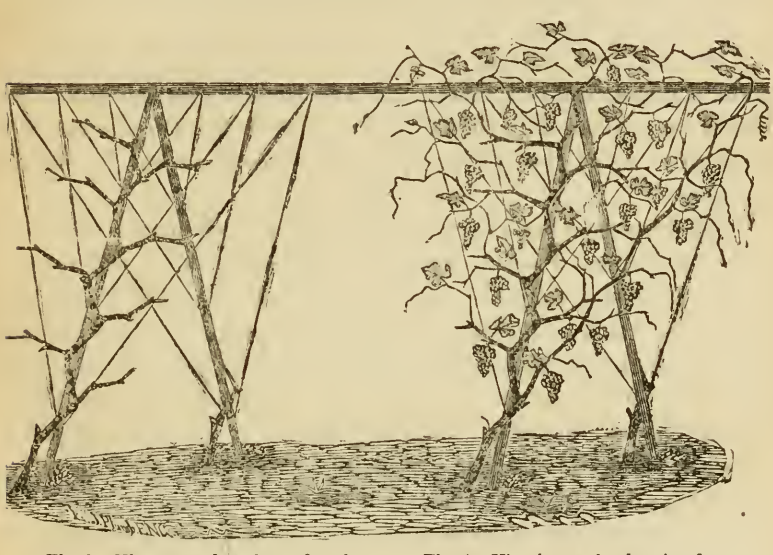


Fig. 3. Vine pruned at close of each season.

Fig. 4. Vine in regular bearing form.

The posts may be quite small, but should be nine feet long at least — eight feet above the surface and one foot in the ground; this will be sufficient, as they are braced both ways. The ridge piece should be one inch by two, and long enough to lap on the third post. This ridge piece should run the whole length of the rows. Then commencing from the top of the post, measure off each way on the ridge piece three spaces, each one foot apart; at these three points drive a nail nearly down to the head; and then measuring down from the ridge piece on the post, divide it into three spaces of two and one-half feet each; at these points drive nails as before, then by stretching wires between these respective

points, parallel arms one foot apart will be formed, to which to fasten the arms of the vine. Strips of board may be used in place of these wires, if desired. Any mechanic who can frame the rafters for a building will have no difficulty in constructing a trellis of this kind.

This trellis is equally adapted to a side hill; the posts are then set perpendicular, and the vines will be longest on the upper side. By training on this trellis, pruning is simplified and is more easily und erstood; the spurs being all at right angles with the main cane, are easily laid down and covered, for winter protection.

In setting out a vineyard, plant good two year old vines. At the fall pruning, cut back to three buds. The second year train a single cane to a stake. Cut this back to two feet after the leaves have fallen off in the fall. The third season a trellis will be required. After the fall pruning, the vine will appear as shown in figure 1.

Well developed buds upon mature wood are essential to producing good grapes. Summer pruning, or rather pinching, will secure these. The cane shown in figure 1 will produce a shoot from each bud, upon which two or three clusters of grapes will set; pinch off the end of each of these shoots two or three leaves from the last bunch of fruit; pinch off all laterals except the last one; after these have extended two joints, pinch them off again, with the exception of two or three of the upper shoots; these will act as a safety-valve to the vine to prevent the pushing of the next season fruit buds. To allow a large growth of shoots the most of the summer, and then slash them off with a sickle, is all wrong, damaging both fruit and vine. Early pinching is beneficial to both. Those wonderful bunches of Concord and Rogers' grapes, grown by V. Lowe, of Palmyra, are secured by early pinching of the vines. The vine shown by figure 1 will produce a medium crop of fruit. The shoots are to be kept well pinched during the summer, and at the end of the season it will appear as shown in figure 2; when pruned the same vine is represented in figure 3. The following season two shoots will grow from each spur on the vine, which are to be treated the same as the previous year. In pruning the next season, cut off the poorest shoot on each spur and shorten the one left to two buds, and the vine will be substantially the same as shown in figure 3. When the spurs have extended so as to bring the fruiting wood too

far from the main cane, the vine may be renewed by training a shoot from near the base upon the right-hand vine, as shown in figure 4. Then when pruned in the fall cut away all above this shoot, shorten this one to four or five feet, and the vine will again appear as shown in figure 1.

This trellis is well adapted to the annual renewal system of training. Fasten the fruiting canes to the center wires; train a shoot to each outside wire to take the place of those which fruit the present season, and when pruning in the fall cut away the canes on the center wires entirely, and replace with the new canes the following season. By proceeding the same way each year the trellis will be well covered. I prefer the spur system of pruning for the reasons stated above.

I trust I have made this subject sufficiently plain to enable every one present to train and prune his vines so as to secure the best results in their cultivation. There are some varieties, however, that do not yield readily to the treatment described above, yet these general principles will apply to all varieties. Rampant growing vines may be kept well pinched in upon the lower portion of the trellis, while a few of the upper shoots may be allowed to grow at will. By tying them to the ridge of the trellis they are out of the way, and do not shade and choke the fruit, leaves and wood. The Janesville is much improved by summer pinching, but to succeed best some of the upper shoots will have to be allowed to grow. The Delaware and most of the Rogers grapes are easily controlled. A little experience with different varieties will suggest how close to pinch during the summer. Let beginners plant varieties that have been tested; lay them down and cover for winter protection; remove the covering as soon as freezing is over in the spring; cultivate thoroughly; prune properly, and success will follow.

In closing, I extend a cordial invitation to you all to come and see me and my vines next fall. Come when the grapes are ripe. I expect to show you one thousand vines twined upon these trellises, and thus demonstrate their practicability by use.

DAHLIAS.

MRS. D. HUNTLEY, APPLETON.

The dahlia was discovered by Baron Humboldt, on the sandy plains of Mexico, many thousand feet above the level of the sea. "He gathered the seeds, and sent them to the Professor of Botany at the Royal Garden of Madrid, who flowered the first plant in 1789, to which he gave the name of Dahlia pinnata, in honor of Dahl, a Swedish botanist, a pupil of Linnæus." Other writers have called it Georgine, after Georgi, a Russian botanist, but the original name is the one by which it is now so widely known. The dahlia was then only a single flower, grown from seed, and only the shades of purple and crimson were seen. "The first double dahlia was sent from Stuttgart to Mons. Von Otto, who raised one similar in the royal garden at Berlin in 1809," and after patient labor for more than ten years, he could show only six double kinds. It is difficult to imagine what would have been his delight, if he could have seen during those years of experiment, the thousands of exquisite dahlias which are now grown by gardeners and florists, in this and other lands. Now we can select from the choicest lists, at a trifling cost, and in a few weeks we have far more beautiful flowers than those which then gladdened the sight of the botanist, after years of anxious expectation.

The winter care of dahlias is usually somewhat difficult, but if the tubers are fully ripe they will do well in any dry place, secure from frost; if not ripe they are very unreliable.

The roots should be dug in the fall before the ground freezes, leaving a few inches of the stalk by which to handle the tubers; after drying a day or two in the sunshine, they should be stored for winter. For many years past we have wintered them in a dark closet in an upper room, in boxes or barrels, without sand or any covering whatever, and have invariably found them sprouted in April. (Those wintered in cellars will be fully a month later.) The clusters of tubers should then be put in boxes of earth in a room that will not freeze, and when the sprouts are two or three inches high, transplant to other boxes, or the open garden, if the weather will permit. If treated in this manner, they will invariably commence blooming the last of June, and with proper care,

will give a succession of flowers till late in autumn. Dahlias can be grown in any soil, if fertilizers and a portion of sand is added, but a rich sandy loam is best. In their native place they bloom in the wet season, consequently they require much water. Strong stakes and strings are also indispensable requisites. The best dahlias we have ever seen were near the house, where they received the drip of the eaves, and the dwelling gave protection from the winds. In such situations they will grow from five to nine feet high. They should be set two and a-half or three feet apart, in a deep soil. We have found it best to prepare the ground whenever we wish to set the tubers, by digging places twelve or eighteen inches deep, and as many in diameter, if in uncultivated soil, and then fill up with finely pulverized earth and manures; in each place set a firm stake, and near it set the dahlias. If the staking is delayed till the plant needs support, there is much danger of crushing the young tubers. They are very liable to be broken by the wind, and as soon as of sufficient size, they should be tied to the stake with a stout, soft string that will not injure the stalk. Strips of cloth, or the coarse twine used for tying wool, we have found best. As the season advances they will need much care in this direction. It is often necessary to use two and three stakes, and several feet of twine for a single plant. Dahlias may be grown in upright form, or as bedders, by fastening or pegging to the ground; but for this lofty flower we much prefer the upright method. They may also be trained in espalier form; this shows their beauty to great advantage, and insures protection from storms.

Only one stalk should be grown from a single tuber. Pinch off all side branches as soon as they appear at the axil of the leaves, until a bud appears. The branches next to the first bud should not be removed. After this they will need but little pruning till mid-summer, except to remove all shoots from the roots. Some varieties will perfect all the buds they put forth. Some times thirty perfect blossoms can be found on a single plant. Other kinds must be pruned of two-thirds of their buds, or they will mature only one or two flowers the first of the season. One will soon learn by experience what treatment each variety requires. A dozen good kinds will make a fine display in any garden.

The names of dahlias so often become changed by mistake, that it is never quite certain whether cultivators receive or retain the origi-

nal names. We have found dark colored varieties more hardy than light ones, and better bloomers than the variegated kinds. The best dark dahlias are "High Sheriff" and "Negro Boy." There are several other dark colors so nearly alike that it makes but little difference which is selected — a crimson, maroon, purple, and a scarlet, with two or three mottled or variegated, and a rare color — lavender — yellow and pure white, will make a charming contrast. Some varieties will always become favorites with any grower. The best mottled dahlia we have ever seen is "La Siserre," petals striped with very dark maroon, shaded to nearly white, very showy and much admired by all who see it, but will not bloom well unless severely pruned. Another choice one is the "Goldfinder," a clear yellow of perfect form, very fine quilled, and an abundant bloomer. One of the finest of light ones is the "Princess of Wales," a light blush, slightly tipped with lilac, large flowers; good for decorations. The "White Aster" is the best white dahlia we have ever grown, and the most profuse bloomer we have ever seen. This is a Pompon or bouquet dahlia, but will grow four or five feet high; flowers small, fimbriated, very lovely in bouquets, or wherever white flowers are wanted. "Little Model" is also fine among cut flowers, rosy crimson, closely cupped.

New varieties are grown from seed, but choice seedlings are so rare it is not wise to devote much time to their culture, where time is limited. Early blossoms will usually mature seed, which should be planted the following spring in the hot bed or seed bed, and afterward transplanted. In this manner we have grown seedlings, but never obtained but one desirable variety.

This magnificent flower has been very appropriately called the Queen of Autumn flowers. Its stately growth, abundant foliage and splendid flowers, entitle it to a place in every garden where there is space for its growth. It does not pass its prime in early autumn, like many others, but its blossoms constantly increase in beauty until the sad morning when you find them ruined by an untimely frost. There are sweeter flowers than this majestic one; flowers that we love better, but no flower do we know that will bloom so long, and so profusely, and add so much beauty to the house and to the lawn, as this fine old autumn bloomer. We have found it admirably adapted to the farmer's garden, where there is always ample room, plenty of fertilizers, all the implements neces-

sary for its culture, and a place to store the tubers in winter, with other products of the farm. If the home is new, their rapid growth will soon surround the dwelling with miniature trees, covered with lovely blossoms. If the garden is filled with Flora's treasures, this grand old flower should surely have a place among its lowly, but no less beautiful sisters. If you would have flowers in surprising quantities; flowers of richest, deepest hue, from almost black to purest white, flowers beneath your hand, and flowers above your head, flowers for the garden and flowers for the house, flowers for the church and flowers for the table, flowers for your friends and flowers for the strangers that pass your door, grow dahlias in your garden.

THOREAU'S LIFE OF LABOR AND STUDY IN THE WOODS.

Mrs. H. M. LEWIS, Madison.

In the quiet old city of Concord, that wonderful city of culture, where fertile brains come into life, expand and grow into immortality, Henry D. Thoreau was born, in the year 1817. He graduated from Harvard college when twenty years of age. While in college, and before, he was in the habit of making solitary excursions to woods and fields, in his own way enjoying the mystical and endless works of nature, as well or better than the classical and ancient books made by man.

His father manufactured lead pencils. After graduating, Henry devoted himself to his father's craft, until he suceeded in making a better pencil than was then in use. Upon this, he received the congratulations of relatives and friends, who now saw an avenue of wealth opened to him; but Henry replied that he should never make another lead pencil. His ambition was for knowledge, truth, freedom and action, and he had decided to devote his life to the study of the woods, hills and waters of his native land, even at the cost of disappointing his friends; as he was not willing to sacrifice his noble ambition to any profession or narrow craft. He felt, with the great Agassiz, that he could not waste time making money. He says, "I went to the woods because I wished to live deliberately, to find out the essential facts of life, and see if I could not

learn what it had to teach, and not, when I came to die, discover that I had not lived. I did not wish to live what was not life; living is so dear; I wanted to live deep, and suck out all the marrow of life." He wrote in his journal, "If I had bestowed upon me the wealth of Crœsus, my aims must still be the same, and my means essentially the same."

He had no desire for money, and knew how to be poor without the least appearance of poverty or inelegance. He says, "Do not trouble yourself to get new things, whether clothes or friends; old things do not change; we change; sell your clothes and keep your thoughts; God will see that you do not want society." He easily met his living expenses by doing an occasional piece of agreeable work, like grafting trees, surveying a piece of land, or building a boat or a fence for a neighbor; and when these short engagements were ended, he was sure of his leisure. He never married; ate little or no meat, and never used tea, coffee, tobacco or wine.

When he was twenty-eight years of age he rented eleven acres of land, not far from Concord, on Walden pond, and on it built a small frame house which he occupied for more than two years, living a contented, happy, enthusiastic life, alone, without a cat, dog, chicken or friendly pipe to cheer him in the quiet hours; no company but his own fresh thoughts, and a silver voiced flute, which often awoke the echoes of the quiet dale. He was never homesick or the least oppressed by a sense of solitude but once, and that was a few weeks after he came to the woods, and then, only for an hour. In the midst of a gentle rain, while these thoughts prevailed, he said, "I was suddenly sensible of such sweet and beneficent society in nature, in the very pattering of the drops, and in every sound and sight about my house; an infinite and unaccountable friendliness all at once like an atmosphere sustaining me, as made the fancied advantages of human neighborhood insignificant, and I never thought of them again. Every leaf, bud and pine needle expanded and swelled with sympathy and befriended me." He says, "I find it wholesome to be alone the greater part of the time. I love to be alone. I never found the companionship that was so companionable as solitude. A man thinking or working is always alone."

He began building his house near the middle of March, before

the ice was yet dissolved, and took possession of it the fourth of July. He selected a building spot on a pleasant hillside covered with pine woods, through which he looked out upon the pond. Day after day, he went on cutting down and hewing into timber the beloved pine, and I fancy he almost felt that he was doing a sacriligeous act, and perhaps he, like a Roman of the olden time, prayed, "Whatever god or goddess thou art, be propitious to me!" His noon-day meal of bread and butter, which had imbibed the fragrance of the pine, was greatly relished by him, while sitting among the green pine boughs, reading the newspaper in which his dinner had been wrapped. The days went merrily by, for the robin, pewee and lark sung to him. He says they were pleasant spring days, in which the winter of man's discontent was thawing as well as the earth, and the life that had lain torpid began to stretch itself. He dug the cellar of his house where a woodchuck had formerly dug its burrow, down through sumach and blackberry roots. He says, who knows but if men constructed their dwellings with their own hands, and provided food for themselves and families simply and honestly enough, the poetic faculty would be universally developed, as birds universally sing when they are so engaged. He also says, to maintain oneself on this earth is not a hardship but a pleasure, if we live simply and wisely.

When Thoreau's house was completed it had cost him twenty-eight dollars and twelve cents; one dollar and eighty cents less than the rent of a student's room in Cambridge village. His food cost him, in money, about twenty-seven cents a week, his furniture was most simple and inexpensive, consisting principally of a bed, table, writing desk, three chairs, cooking utensils and a few dishes. He says none are so poor that they need sit on a pumpkin. Nature provided in the form of pine trees all the curtains that he required. He says, "Thank God, I can sit and I can stand without the aid of a furniture warehouse. My best room, however, my withdrawing room, always ready for company, on whose carpet the sun rarely fell, was the pine woods behind my house. Thither, on summer days when distinguished guests came, I took them, and a priceless domestic swept the floor, dusted the furniture, and kept the things in order."

His doors were never locked, and friends often came in to enjoy the cheer of his little cabin when he was on his excursions, for he

had many engagements to keep with favorite trees and plants. The aroma of a pipe, a pile of whittlings on the hearth, a flower, a bunch of grass, sticks, twigs or a crumpled leaf, which the owner had unconsciously dropped, told the story that Thoreau so easily read.

As bread was to be the important article of food, Thoreau resolved to try the making of various kinds. His first experience was with hoe-cakes, baked upon a shingle, but that was wont to get smoked, and have a piny flavor. Next he tried wheat bread with yeast; but the yeast proved troublesome, and at last he went back to the primitive days of unleavened bread, using a recipe Cato gave about two centuries before Christ, which I will give: "Make kneaded bread thus: wash your hands and trough well; put the meal into the trough; add water gradually, and knead it thoroughly; when you have kneaded it well, mould it, and bake it under a cover," that is, a baking kettle. He says, "in cold weather it was no little amusement to bake several small loaves of this in succession, tending and turning them as carefully as an Egyptian his hatching eggs. They were a real cereal fruit which I ripened, and they had to my senses a fragrance like that of other noble fruits which I kept in as long as possible by wrapping them in cloths."

For more than five years he maintained himself solely by the help of his hands, and by working six weeks in the year, he could meet all the expenses of living. Therefore, the whole of the winter and the larger part of the summer time was his own, to be devoted to study, labor, rest and meditation. He says, "I was rich, if not in money, in sunny hours and summer days, and I spent them lavishly." He planted two and a half acres of his land to beans, a small part to potatoes, peas, turnips and corn. He says, "the bean field yielded me various lessons and results that could not have been obtained from printed books. I became intimately acquainted with my beans, planting, hoeing, picking over, and selling them, which was the hardest of all;" and while cultivating the acquaintance of his beans, he also made many other curious and interesting acquaintances among a multitude of herbs and plants.

Emerson says Thoreau was an industrious man, and setting like all other highly organized men a high value on his time, he seemed the only man of leisure in town; always ready for an excursion that promised well, or for a conversation prolonged into late hours.

Thoreau devoted his genius with such entire devotion to the fields, hills and waters of his native town, that he made them known and interesting to all Americans and to people over the sea. Thoreau says: "Every morning was a cheerful invitation to make my life of equal simplicity, and I may say innocence, with nature herself. I have been as sincere a worshipper of Aurora as the Greeks. I got up early and bathed in the ponds; that was a religious exercise; and one of the best things which I did. That man who does not believe that each day contains an earlier, more sacred, and auroral hour than he has yet profaned, has despaired of life, and is pursuing a descending and darkening way. The Vidas say all intelligences awake with the morning."

The morning hour was not one of slumber for this disciple of Aurora, for with wakefulness came life and action. His intimate friends, the birds, bees, insects, animals and flowers, had each a secret to whisper into his willing ear, and how could he sleep, the birds sang around and flitted through his house. The rustic mouse crept stealthily up to his hand to share the bread and cheese; the squirrels chattered on the roof overhead, or under the floor beneath his feet; the wild geese and laughing loon were bathing in his pond, and the sumach was growing so luxuriantly before his eyes in front of the window, that in the silence he could hear it burst asunder and fall to the ground. The wind, fog, rain and sunshine, each had its secret to communicate; had he time for brooding, sleeping, or discontent?

Some days he says he grew like corn in the night; those days were when he sat in the sunny doorway from sunrise until noon wrapt in a reverie amidst the pines, hickories, and sumachs, in undisturbed silence and stillness. "I then realized what the orientals meant by contemplating and the forsaking of works; these were not days subtracted from my life, but so much over and above my usual allowance."

Emerson says: "It was a pleasure and a privilege to walk with him; for he knew the country like a fox or a bird, and passed through it as freely by paths of his own. Under his arm he carried an old music book to press plants; in his pocket a diary, spy glass, microscope, jackknife, and twine. * * He waded into the pool for the water plants, and his strong legs were no insignificant part of his armor. On the day I speak of, he looked for the menyan-

thes, detected it across the wide pool, and, on examination of the flowerets, decided that it had been in flower five days. He drew out of his vest pocket his diary, and read the names of all the plants that should bloom on this day, whereof he kept account as a banker, when his notes fall due. The cypriepedium not due till to-morrow. He thought that if he waked up from a trance, in this swamp, he could tell by the plants what time of the year it was within two days. Presently he heard a note which he called that of the night warbler, a bird he had been in search of twelve years. I told him he must beware of finding and booking it, lest life should have nothing more to show him."

He noted what repeatedly befel him, that, after receiving from a distance a rare plant, he would presently find the same in his own haunts. And those prizes of good luck which happen only to good players happened to him. One day walking with a stranger who inquired where Indian arrow-heads could be found, he replied, "Everywhere," and, stooping forward, picked one, on the instant, from the ground. One day, as he was leaping from one mossy rock to another, he fell and badly sprained his ankle. While on the ground, he discovered a plant he had been long looking for — the *Arnica mollis*, a plant famous for its healing powers.

One of the weapons with which he conquered all obstacles in science, was patience. Says Emerson: "He knew how to sit immovable as part of the rock he rested on, until the bird, the reptile, the fish, which had retired from him, should come back and resume its habits; nay, moved by curiosity, should come to him to watch him."

The coming in of winter, with its storms of snow and rain, was carefully watched and noted by him, and a faithful record of the fall of snow and rain kept. He says there was never yet such a storm but it was Æolian music to a healthy and innocent ear. In winter he made a map of Walden Pond, his small ocean, and put down more than a hundred soundings, to ascertain its depth and shape of its bottom. When the ice was new and very clear, he would stretch himself at full length upon it, and study the habits and haunts of the fish and aquatic animals, with the living plants they fed upon. His papers upon the fresh water fish of the north are full of interesting instruction to ichthyologists.

Thoreau's "Walk to Wachusett Mountain" is, in my opinion,

one of the best productions. As he climbs the everlasting hills, the eye and ear take in everything beautiful and pleasant. He notes the breathing of the cricket, the lowing of the kine, the trees, the flowers, the berries, clouds, animals, birds and their habits, the stone with the lichen growing upon it, the shades of night creeping over the valley and mountain, the calm, majestic moonlight, with Saturn and Jupiter on either hand, the night birds' song, and the camp fire's sparkle. Afterwards he notes the gray of the morning, and the sun's majestic rising out of the sea. Every moment seemed an inspiration to him. He saw more of nature on that little excursion — that, perhaps, cost him no more than a dime, for he made a supper of huckleberries and milk — than thousands have seen in traversing half the globe.

He had the poet's artistic eye and he gives us many charming little pictures which are felt by us, if not seen. One that pleased me much was of house cleaning. When his house was soiled he took his household effects out of doors upon the grass; then sprinkled white sand from the pond upon the floor, and with broom in hand scoured it white and clean. He thought it very pleasant to see his furniture out of doors under the trees. The bit of color, like a Gypsy camp, delighted his artistic eye. He thought they looked so much at home and familiar out of doors that he was sometimes tempted to stretch an awning over them, and take a seat among them.

Another delightful picture was of his home in winter, when poet and philosopher sat with him around his cheerful fire enjoying a dish of gruel, talking the entire night away; their souls flowing together in the same deep channel; "whichever way we turned," he says, "it seemed that the heavens and the earth had met together, since he had enhanced the beauty of the landscape."

Finally, we would say that we gladly and enthusiastically recommend Thoreau's books to all lovers of the beautiful in nature, except money makers, be they male or female, in city or town, or in the beautiful country where entertainment of the heart should be secondary to that of man. For in the country it is that the true poems of life have been written from the beginning of time, and will be to the end thereof. The world is better to-day for having brought into life Henry D. Thoreau, this true friend of man and lover of nature. He had his faults, as who has not, but he has

taught us to be true to ourselves, to our country and our God. For upon truth, the foundations of the world are laid. He taught us the true religion when he said: "Man flows at once to God when the channel of purity is open. He is blest who is assured that the animal is dying out of him day by day, and the divine being established."

Thoreau died in comparative youth and obscurity. Few men knew of his greatness until he had left them for the other home, and his last words will surely be a prophecy: "For joy I could embrace the earth; I shall delight to be buried in it. And then I think of those among men who will know that I love them though I tell them not."

"To these, to these, their thankful race
Gives them the first, the fairest place,
And brightest is their glory's sheen,
For greatest hath their labor been."

FLOWERS FOR ALL.

MRS. D. C. AYRES, GREEN BAY.

It is for a very plain and practical purpose that I present this paper before those who, perhaps, know far better than myself, the need of a consideration of its topic. That the rich may have flowers is self evident; that those in moderate circumstances may obtain them, is proved by the fact that they have almost the monopoly of the enjoyment; but that the poor, the really poor, who struggle daily for a daily existence, should enjoy floral treasures, and watch leaf, and bud, and flower, until they too shall claim Heaven's choicest gifts as their own heritage, seems to others than themselves, almost an impossibility. True, a rose bush, geranium or box of mignonette in one window of an humble home, proves the love of some can surmount the difficulty, but they are the exception. A little flower bed, protected from the inroads of surrounding animals in some secluded spot, speaks of aspirations for the beautiful, but ah! how many homes are barren and drear, which should be bright with floral brilliance.

Let us discuss to-day, how to bring the wealth of nature to the doors of those who may be deprived of other enjoyments in life,

seeking to raise the refinement of these to a higher tone. In the effort, we shall do our state and country service, as with increase of pure pleasures comes decrease of vice.

That there is an inherent love of flowers in the heart of most persons, surely no one will deny; that the time given to their culture is full of the truest enjoyment is undoubted, but there are very many who bear in their hearts the love, who never find time to gratify it; and why? Fifteen minutes a day will keep several flower beds in perfect order, if attended to regularly, and with judgment. Who does not pass fifteen minutes in a day less profitably? It is so much trouble, is another reason; but this never comes from a true lover of flowers. What is better worth a little trouble, than to brighten and refine a home with the ornaments of Nature? In this grand western land, where ground is so free in its breadth and space as not to be fully appreciated, want of room can only be alleged by the incorrigibly lazy. Poor men own lots which in an eastern city would be sufficient for blocks of houses; and no family need try to raise a few straggling plants in the window of a fifth story tenement room, as is done by the city poor.

A more valid excuse is the expense. To have flowers, something more than earth is needed. Let a young girl try to prepare a little piece of ground for flowers; immediately wants present themselves; the bed dug and raked; where are the roots, the seeds, the plants and cuttings? She has no money. A farmer's hard earned money must, in most instances, after his family are plainly clothed, go to purchase the means of making the farm more productive, or labor more profitable. Flower seeds are an extravagance not to be thought of. An enthusiastic lover of flowers might fill up the beds from the woods, but it requires acquaintance with the "lore of the forest," and she has it not; besides, she has had these, lovely as they are, all her life, and she wants those that she sees in gardens — city flowers.

Did it never occur to anyone, that amidst all our charities this matter is overlooked; that those able to purchase, and they who year by year save seed for their own use might easily give to those unable to obtain them otherwise, and thus reap for themselves a summer of blessings? Who that has had the privilege of taking flowers to the aged and invalid, receiving their grateful thanks, but would desire to increase their power to do good in this way?

There is one plan by which homes now drear and barren may be cheered and enlivened: Floricultural societies formed by ladies, connected with and auxiliary to our county agricultural and horticultural societies, would afford facilities and opportunities to be obtained in no other way. Seeds procured in large quantities, at greatly reduced rates, could be easily divided among members of such societies, to be again divided by them as needed. Information on planting, transplanting, arranging in masses, providing for bloom at different times of the season, protection in winter, cultivation and propagation of house plants; all these, and numberless other subjects, could be discussed. Experience would reveal knowledge not found in the books, while theory would have to be proved by practice. Those who have made floriculture their delight, should take pains to impart of their learning. Especially should it be a primary object to arouse the spirit of cultivation in those who have supposed that circumstances deprive them of its possibility.

When the door yard of every farm house is neatly fenced in, the fence whitewashed, and covered with vines; beds of flowers, and stands and rustic vases blooming with beauty; every old tree trunk covered with mosses and vines, hiding its unseemingly proportions; then shall we find neatness and order assuming its place in the interior of the house; the tired mother will find rest in the brightness around her; the young people will have something to interest them at home, and even the wee little ones in their play gardens can enjoy "loving flowers."

This must be woman's work. It may be a whimsical thought that when weeds became Adam's portion, flowers became Eve's.

> "Are ye gifts from the angels, ye beautiful flowers?
> Did they waft thy seeds from heavenly bowers?"

Surely they do angel's work in lightening heavy hearts and comforting weary souls. Most gladly would I welcome the thought that these words may induce some to take an interest in this matter, and in a regularly organized form, to set about winning the attention of the really poor to the cultivation of flowers. And while we wait for these societies to be formed, let me suggest as a matter of experiment, that every one who can do so, should procure seeds for distribution, and those saved from last season, and give of their abundance, not neglecting

a word of friendly counsel, and the impetus of sympathetic interest. Let us then see if we cannot help others in this matter. What will cost a little money, a few kind words, some practical advice, may brighten many lives. Let the spirit of the sweet flower charities of the city extend into the country, and bring to the strong and well a new and delightful pleasure as well as to the sick and suffering. In helping others, we aid ourselves, and add usefulness and happiness to our own lives.

HOW TO MAINTAIN INTEREST IN LOCAL SOCIETIES.

WERDEN REYNOLDS, Green Bay.

"All work and no play makes Jack a dull boy;
All play and no work makes him a mere toy."

Corollary — Duly intermingle work and play and make a sprightly sensible young man out of Jack.

You may have heard the rhyme before. Perhaps Adam's boy did. On this point the Bible is silent; nor have I been able to find in history, sacred or profane, account of its origin or its author. But the memory of man runneth not back to the time when it was said or sung, and I am constrained to believe that it sprang up spontaneously from the experiences of much vexed mothers, as weeds spring up spontaneously from the harrowed bosom of mother earth. I accept, therefore, the authorless rhyme as a compendium of fact and an aphorism of philosophy, and rank it first among apothegms for universality of the fact and comprehensiveness of the philosophy. Fact done and demonstrated by a measureless majority of the male babies borne of Adam's race — philosophy rooted and grounded in the fundamental elements of living nature.

I propose to recognize the doctrine of this trite aphorism, in both its branches, in a brief discussion of the question, "How can interest be sustained in the meetings of country agricultural and horticultural societies?"

First the fact. I do not go back through the ages, nor pry into archives of any nation past or present, to gather notable examples and collate illustrations, but content myself with a single case — the only one in which we are at all particularly interested — and

relate that case in a concise history of Brown County Horticultural Society.

This society was instituted in the month of January, 1874. It was, perhaps, the offspring of a growing conviction that the city of Green Bay and its vicinity had reached a period of its existence when recourse must be had to other sources of wealth and prosperity than the aboriginal forests of pine and other timbers which had, for two centuries, furnished the almost exclusive material for business and traffic; when, indeed, it must go down beneath the very roots of those uncultivated trees and dig out of the underlying soil its future wealth and subsistence. The importance of the undertaking was realized; men competent as any in the city for conducting an enterprise of importance joined hands, and the society was instituted.

For the first two years it held its meetings in the editorial rooms of one of the oldest journals of the northwest, where every facility for obtaining information was at hand, and all the surroundings conspired to favor the work and objects of the association. Its original membership comprised men of experience, men of observation, men of high culture, of executive talent and enthusiasm, *practical* men; in a word, the men who inaugurated the Brown County Horticultural Society were even qualified and competent to take in hand, conduct, and carry on to success, such an institution as they had inaugurated. And they demonstrated their ability by masterly essays and disquisitions, instructive and entertaining discussions, and vigorous and unremitted prosecutions of the objects of the association in all directions.

For a time interest was steadily maintained, and though few accessions were made to the membership, yet the original members came up to their work in full harness, and generally much enjoyed the sessions of the society. But at length the enjoyment began to decline, interest to wane, and attendance to become unsteady; in fact, the society languished and work grew heavy. And so it came to pass that the meetings were not always held. From semi-monthly they fell off to one per month, and then that one was occasionally neglected or forgotten, and finally they were intermitted altogether for more than a year, and the society came near giving up the ghost entirely.

Now why came such condition to be? What element of prosperity was lacking? What condition of success had been over-

looked? What source of interest neglected or forgotten? Let me answer — "All work and no play makes Jack a dull boy." The faithful men who wielded the destinies of the society, with all their versatility of talent, did nothing but solid "work." They never dreamed that any form of recreation could possibly enter the proceedings of so grave and dignified a body as that of the Brown County Horticultural Society, or that life and animation could flow into its membership from any such quarter. They were not at any period of the decline conscious of abated interest in the objects of the society, and could not tell why there existed not the same zeal, the same enthusiasm, the same prompt and unremitted attendance upon the meetings as at first. But the fact was before them. Jack had grown dull, unconsciously, it is true, yet there he stood, staring them in the face, an unmistakably dull boy — dull but not dead. And then they held grave council to devise some means of re-animating dull Jack, some process, magical or otherwise, of infusing new life into him. Wisdom presided in that council and inspired its deliberations; therefore was its purpose accomplished.

And now without further allegory, let me tell you how the society was brought into its present state of animation and prosperity. The president succeeded, by personal solicitation, in getting a goodly number of the members to meet at his house in the spring of 1877, when, among other things done, a resolution was adopted to hold the meetings during the summer season, on the premises of such farmers in the county as should be willing to furnish out-door accommodations; to connect with the same a basket or pic-nic dinner; and to take wives and children to the meetings. This was the "play" they first put in with the "work," and it at once proved a marvelously powerful revivalist. Under the inspiration of this new force, the regular business of the society was transacted and its objects carried forward with greater zeal, energy and efficiency than ever before. Good results followed immediately, better, indeed, than the most sanguine of us had anticipated; among which was, that by the time fall harvests had been gathered in, the society had also harvested a large addition to its membership, and that, too, from the very class of people to benefit whom was its primary and paramount object — the farmers themselves.

Other fortunate results followed in due course sooner or later, as it took longer or shorter time to develop them. Interest in the

appropriate business of the meetings increased. A desire to share in the advantages of connection with the society, in its addresses, its discussions, its volumes of transactions of the state societies, and its other means and processes of developing and disseminating knowledge in the various departments of husbandry, rapidly grew and spread among the farming population of the county. And already the permanent results of the lively interest thus created and sustained in the labors of the Brown County Society, clearly appear in the large addition, during the past year, to the cultivated territory of the country; the improved condition of the farms, and the corresponding increase and excellence of farm products. The society continued these farmers' pic-nics, as its meetings came to be designated, till the close of the out-door season of 1877, and then it returned to monthly sessions in the common council room of the city, where, during the ensuing winter, a faithful few continued to preserve its existence, and, perhaps, prepare somewhat for the campaign of the next year.

In the spring of 1878, the campaign of the farmers' pic-nics opened again, and has since been carried on even to the present, not only with unabated, but with constantly increasing interest and success. We did, however, in the beginning of the season, introduce a new feature into our proceedings, namely, music, both vocal and instrumental, duly distributed through the scientific deliberations. This was the second element of "play" granted dull Jack, and he felt and appreciated its regenerating power.

I said the society had continued its meetings at the houses of its members since the spring of last year to the present. When fall came, however, and the gardens, groves and orchards of the farm premises were shut off from our use by the cold, we gathered into the mansions themselves of the farmers, intending to carry all our plays with us; but I am compelled to say that we have thus far been forced to leave behind the principal one of them, our picnic baskets, for the reason that the farmers or their wives have insisted on heaping up the tables with the products of their own toil and tillage, without waiting for the baskets to pour out their various contributions. I would, however, scarcely recommend this particular act of the "play" to other associations, because there may be behind the scene too great a cumulation of solid work, and that, too, to be done by those whom we would delight to relieve, as far

as possible, from task or burden of every kind. The host is a personage and power whose influence we would propitiate from motives as well of policy as of pleasure.

The society now not only exhibits no signs of weariness, no marks of work-worn woefulness, but obviously stands up before the people of the country in far greater freshness, vigor and efficiency than ever before. Indeed, the last meeting, held only two weeks ago at the house of a member who is here present, is unanimously pronounced to have been one of the most interesting which has occured in its whole five years of life. Mr. J. M. Smith, our president, and yours too, the Hon. W. J. Abrams, who read an able essay on that occasion, and Mr. H. K. Cowles, the large and successful farmer at whose house the meeting was held, all of whom are here present, the two last named as delegates, can verify all I have stated of the past and the present of the society.

Thus much in proof and exposition of one *fact expressed* and *one implied* in the trite apothegm placed at the head of this article. I have shown in reference to the Brown County Agricultural and Horticultural Society, that "all work and no play makes Jack a dull boy." I have not shown nor attempted to show, for I had no occasion to do so, that "all play and no work makes him a mere toy," but I have further shown that a due alternation of "work" and "play" — the latter of which terms, so far at least, as my present purpose is concerned, is just equivalent to rest — is highly important and probably essential to the complete success, not only of said society and kindred institutions, but of every enterprise of magnitude undertaken by human hands.

And this leads me to the second branch of the subject, the philosophy embodied in the quotation just referred to; upon which only a few words. Defining "play" in its relation to "work," to be just equivalent to "rest," a definition which is as manifestly a physical *truth* as work is a physical *fact*, I reassert that a fundamental doctrine of philosophy is taught in my text; a doctrine founded in the very structure and constitution of the human body and soul, a doctrine which is, indeed, but the utterance of a universal law impressed by the creative fiat upon all living things. Nothing that breathes, nothing that lives without breathing, can continuously, for any relatively long period of time, perform those functions which we are accustomed to designate, though perhaps

with more or less vagueness, by the term *labor* or *work* (or *growth* in the case of non-breathing beings), in distinction from those which, with equal indefiniteness, we are in the habit of characterizing as *rest*, without inducing in all sensitive beings a weariness, a heaviness, a sense of surfeit and consequent disrelish, approaching, and if unrelieved, eventually culminating in those stronger mental affections denominated displeasure, disgust; which affections we all know, if cherished in regard to any voluntary enterprise whatever, are an effectual bar to all interest therein. Such is the relation established by the All-creator between labor and rest, and illustrated by himself for the good of his creatures, as recorded in the Books of Moses. Alternate succession of labor and rest, of work and play, is therefore a divine ordinance, and, of course, as necessary to successful issues as food is to the sustenance of the body, or mental aliment to the growth of the soul.

But I will weary your patience with no protracted discussion of what I accept as a principle of sound philosophy, the recognition of which has led me to the only answer I can render to the question, "How can interest be created, and sustained in local associations to this State Horticultural Society?"

My general answer is, connect with and intermingle in the legitimate work and exercises of your meetings, other things and doings designed to operate solely as attractions and entertainments. More in detail, permit me to suggest for trial a series of directions and exercises to be varied or modified according to the peculiar circumstances of the society, something like the following:

1st. Hold the sessions of the society during the summer season, certainly, all the year, if possible, not in school houses, or town halls, or city council rooms, but on the premises of the members.

2d. Let the programme of regular exercises embrace some leading topic previously named, to be presented either by written essay, or by extemporaneous address, by some person also previously engaged or appointed to this work.

3d. Let each formal or leading speech be followed by free colloquial interchange of views and relation of personal experiences.

4th. Select subjects for consideration as far as possible with reference to the work about to come practically before the cultivator, in the garden or the field, according to the season of the year, and which for this reason are of special interest at the time.

5th. Arrange for a little musical, dramatic or other entertainment, such as may be at your command.

6th. Make the picnic dinner a prominent feature of each monthly or quarterly session, and invite all the friends of the society and their children to the festival.

This is substantially the programme carried out with variations, by the Brown County Society for the last two years, with results such as have been briefly hinted at in the preceding part of this paper. I conclude by repeating a counsel found in the good book, "Go thou and do likewise." And thus doing, I pledge you that Jack will stand up before you neither a "dull boy" nor a "mere toy," but a smart, enterprising and useful young fellow.

Mr. Kellogg — It made me feel bad to hear what a wonderful time Thoreau had, and to think what he might have done if he had only looked around. It might have prolonged his life and made him so much more useful, if he had only just found the right kind of an old maid to share life with him.

Mr. Field — I do not think I can add anything to what I have already heard. I have listened with a good deal of pleasure to the papers that have been read. I regret exceedingly that so few of the ladies we expected here were present. The reading of their own papers gives them a better effect. We get the best sense from them; better than we do when they are read by another person, however well read, as they have been this afternoon. I symypathize to some extent with my friend Kellogg in relation to this young gentleman we heard so much about, and so very pleasantly read of by Mrs. Lewis of this city, and certainly there are many thoughts in that paper that are of interest to us all; many lessons were there taught, and especially, that we need but little in this life to make us happy, but little expenditure for food or clothing or shelter; and yet she tells us that he was supremely happy. No, I will take that back; said that he was happy, that he enjoyed all these things in nature and that he was happy; and I think she stated in the latter clause of her paper that he was true to himself, true to his country, and true to his God. I could hardly reconcile that with the first clause, or nearly so, of her paper, where she said he was unmarried. I think that is hardly possible, and yet he might, perhaps, have enjoyed life reasonably well, but to say that

he fulfilled his duty to himself, to his country and to his God, I cannot see it in that light. Mr. President, I did not rise to make any remarks; I simply rose to make a motion thanking the ladies who have prepared these papers, and especially the one who has dared to come here and read it. They have given us some very excellent thoughts in these papers, that are worthy of consideration, and I move you that the thanks of this joint convention be tendered to them.

Motion carried.

Mr. S. Barter — I would like to make a few remarks, although I am a stranger here. The text of my remarks will be, Summer Flowers. I came here without any preparation, but fearing that some of the ladies who have presented such highly interesting papers may think they are not appreciated, I think it is proper for us to say something in regard to them. The one that has been the most pleasing and attractive to me is the article on Summer Flowers, read last year by Mrs. Huntley. If any lady or gentleman has not read it, it will well repay them for perusal. This article is the more attractive to me from the fact that I think the cultivation of summer flowers is attended with less trouble than any others. House plants are attended with a great deal of trouble and care. During the last cold spell that we had, I received a letter from my wife which said that our friends and neighbors had lost nearly all their house plants during that cold snap, but summer flowers are attended with very little trouble. I think that any of our friends who have any experience in the cultivation of house plants, should give their experience from the best modes they find in their cultivation. My plan of sowing seeds is, to put them in rows about a foot apart. In that way we can follow along in the row as the seeds come up, and hoe out the weeds between the rows when they are so small that you can hardly tell the flower from the weed. In this way I have succeeded admirably in raising house plants from seed. You generally get them too thick in the row, but you can transplant them if you take them in a moist time, and set them in any part of your garden, and they will scarcely know that they have been moved. The best success I have had has been in raising pansies. Any one who has had any experience with pansies will concede that they are perhaps the best flower that is raised, taking all

things into consideration. There is very little trouble in raising them, and their variety and beauty cannot help pleasing any one who has any appreciation of flowers. I shall be very glad to see Mrs. Huntley's articles on dahlias in print. She discusses it admirably. Last summer I had very good success with dahlias. I had a very elegant yellow one, and a white one, which was a dwarf plant, but very excellent in color — pure white — a beauty. It remained long in blossom, but was not a very free bloomer. I had a mottled one which was very good. I have about a dozen vases and intend to add about a dozen more, perhaps a hundred, before I get through. In speaking of the growth of roses, it might be well enough to state that a great many people have been discouraged about raising roses in Wisconsin, by the many enemies they have to contend with, the slugs and the small bugs which perforate the leaves. The small bug is the greatest enemy of the rose plant, but they are very easily destroyed by a weak solution of Paris green. Put it on with a little wisp broom; one application entirely destroys the bugs so that they never afterwards hurt the bushes. Many persons present, I presume, have heard about the "Last Rose of Summer." I anxiously watched them until the last blossom fell away, and certainly regretted it when it went. Roses are certainly the best summer plants, both in fragrance and in beauty. There is no reason why we cannot have a splendid display of roses in this climate. It is very little trouble to protect them in winter. My method is to lay them carefully down and let some one drive sticks on each side of the bush. Then tie across the rose bush with twine to hold them down in that way, and cover them with straw. That is ample protection.

Mr. Smith — I want to say that Mrs. Huntley is an old acquaintance of mine. What she preaches in regard to flowers she practices. Her husband is a farmer, and I know of no reason why any common farmer cannot have flowers, and have as pleasant flower beds and as pretty ones as she does. Her dahlias and flowers as I have seen them, year after year, are equal to her descriptions; fully so.

Mr. Plumb — I think we have in the paper of Mr. Reynolds some good substantial teaching in regard to the conduct of horticultural societies. It is from a practical standpoint. Almost all the instructions we have on this subject are from a theoretical stand-

point, but happening to have been with this society, at least, at one of their meetings, and knowing their history, their progress, and their complete success, I wish you would especially bear in mind the instructions and advice given in that paper, and if it comes in your way in your homes or in your communities to put those things in practice, treasure them carefully. They are valuable words. I believe it is within the province of every thinking man and woman to unite themselves in every community into a local horticultural society that shall carry out this work and disseminate these beautiful and interesting and profitable truths, that we get here at these meetings.

Mr. Kellogg — I would like to know the best method of catching the codling moth, if there is any practical method.

Mr. Olds — My experience goes to show that pasturing an orchard is the best remedy where it can be done. Pasture the orchard with sheep or pigs in the early part of the season, so that all the early wormy apples are destroyed. Then you will not have trouble with the main crop.

Mr. Chipman — I want to give my experience in pasturing orchards. I had heard so much about this being a great benefit. I had a large hog field connected with the orchard, and if it would benefit the orchard I thought I would turn them in and fence them in. They ate the apples and lay around the trees. They ate the corn finally, but before they ate the corn they killed the last tree in the orchard. They lay around the trees and, I suppose, tramped them to death. The trees all died. The trees were from five to twenty years old, and some of them twenty and twenty-eight inches through. Every tree in the orchard died, and I could find no other reason, only the hogs walking and eating the corn and getting in the shade packed the earth pretty solid, and the next spring there was but one tree that leaved out any, and that shed its leaves within a month.

Mr. Phillips — I had twenty hogs last fall and set apart five acres for hogs. I set rings in the hogs' noses. There was some old straw in the corner for them to lie on. They behaved as well as Jersey cows all summer. They did not hurt a tree in my orchard that I know of. There were some four or five hundred trees. I am going to turn them in next summer. So there are two sides to this ques-

tion. I noticed the hogs did go and lay under the trees. I found one or two places where they had rooted, although I had rings in their noses, but I thought it would be a benefit to the ground where they stirred it a little.

Mr. Kellogg — A neighbor of mine a mile from me injured an orchard by turning in a large quantity of hogs. The season was wet and the foliage not very abundant, and those hogs tramped that ground sufficiently to injure the orchard.

Mr. Peffer — I have a neighbor that has a small orchard of twenty trees, and one who had fifty trees in his orchard, and the corn was not very good and the hogs wanted something to eat, and they gnawed the bark off the trees; and when there was not enough of that, they gnawed the bark off the roots; the consequence is, there is not a live tree there.

Mr. Chipman — There was no gnawing the trees whatever in my orchard. There was plenty of corn for them to eat, and they lay there and packed the ground. They had some fifty acres of grass they could run out to if they chose, but they chiefly ate the corn and came under these trees and lay there; and when they had laid there long enough they would go away. We planted the orchard to corn the same as we did the field. I intended to fence between the orchard and the field, but so many said the hogs would benefit the apple trees, I let them all go.

Mr. Keyser — What breed of hogs did you have?

Mr. Chipman — Pretty well graded up Poland-China.

Mr. Field — What condition was your ground in? Was it packed down very hard?

Mr. Chipman — Very solid. The land had been corn land for about seventeen years. That was the first year I ever turned hogs in it. Under every tree where the hogs lay the ground was packed as hard as a road. I think the packing of the earth was the cause of the dying of the trees.

Mr. Kellogg moved that the thanks of the joint convention be tendered to the different railroads for their kindness.

Unanimously adopted.

On motion, the convention adjourned.

ENTOMOLOGICAL NOTES.

As but few of the farmers and horticulturists of the state are familiar with the habits and transformations of even the most common of our insect enemies, it was thought best to give a much fuller account of some of those briefly mentioned by Dr. Hoy in his address on Insects. In the preparation of these notes, the reports of the leading entomologists, especially those of Dr. Harris, Profs. Riley, Thomas and Packard, were frequently consulted, and facts there gathered were arranged so as to give a general rather than a complete scientific account of the life history of the insects described. The thanks of the society are due to Prof. Cyrus Thomas, State Entomologist of Illinois, and to Miss Emma A Smith, of Peoria, Illinois, for their kindness in giving us the use of some of the cuts illustrating the notes.

ORCHARD.

Clisiocampa Americana — Harris.

The codling moth, the canker worm and the tent caterpillar are justly regarded as the three great enemies of the orchard. In destructiveness, arising from numbers and general distribution, the first is usually considered much the worst for the apple. The canker worm and the tent caterpillar are confined to narrower limits, but are equally, if not more, destructive to orchards infested with them, for while the codling moth leaves a portion of the crop unharmed; they annihilate all the fruit and impair the vitality of the trees. The tent caterpillar is much more generally known and widely extended than the canker worm, owing to the fact that in its habits it is much more likely to attract attention, and it is much more easily conveyed from place to place in the moth states.

They multiply very rapidly when once they have gained foothold, and unless active measures are taken for their destruction, they soon extend over large areas, and will come year after year, stripping orchard and forest of their foliage. Yet if the right means are used, and at the proper time, there are none of our insect enemies so easily destroyed, or so completely under our con-

trol. Many calling them the army worm believe that they come from some unknown place, in some accountable manner, fully armed and commissioned for the work of destruction; but their origin and development is at, or near, the field of their operations. Every step can be seen by the careful observer, and in every stage of their development, for nearly the whole year through, they are exposed to the attacks of those who earnestly seek their destruction. The farmer or gardener who allows them to come year after year, destroying both fruit and tree, has no one to blame but himself; it is not chargeable to Providence, old Adam or anything else except his own ignorance, indolence or shiftlessness.

The worms first make their appearance soon after the leaves start in the spring, usually about the first of May, hatching from eggs laid the previous summer by the parent moth on the twigs of the trees, near or on the new wood growth. They readily find and feed upon the tender leaflets, and at once begin to spin a company web in some convenient fork of the limbs, to serve as shelter from heat and storm in the earlier stages of their growth; each adds its silken thread to make their common home. For the first week or ten days they gather here at night and in inclement weather, going out in the forenoon to the nearest leaves to feed. Each worm as it passes back and forth, spins its thread, which soon forms a silky highway on which they travel much more readily. Being very small at this stage, they usually escape notice, unless attention is drawn to their glistening web; but their growth is rapid. In a week or ten days they cease to gather nightly in their tent; a few may be found there still, but the largest part lie on limbs near where they have been feeding during the day, or gather in masses on the larger limbs, and even on the body of the tree, in the same manner as the forest tent caterpillar does, and often remain inactive and torpid for hours, while moulting. After casting their skins they scatter and devour the leaves with increased vigor. There are four of these changes in the four or six weeks passed in the larvæ state.

Harris describes the worm "as about two inches in length when fully grown. Their heads are black; extending along the top of the back, from one end to the other, is a whitish line, on each side of which, on a yellow ground, are numerous short and fine crinkled black lines, that, lower down, become mingled together, and form

a broad, longitudinal black stripe, or rather a row of long black spots, one on each ring, in the middle of each of which is a small blue spot; below this is a narrow wavy yellow line, and lower still the sides are variegated with fine intermingled black and yellow lines, which are lost at last in the general dusky color of the under side of the body. The whole body is very sparingly clothed with short and soft hairs, rather thicker and longer on the sides than elsewhere." At all stages of their existence the larvæ are enor-

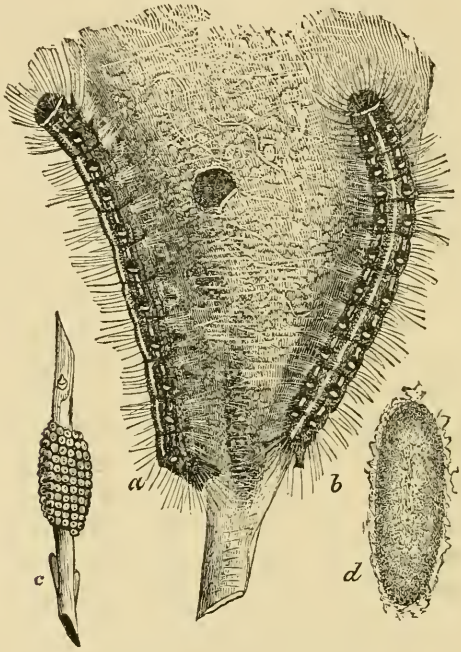


FIG. 5. ORCHARD TENT CATERPILLAR.

a b. Full grown larvæ. *c.* Egg cluster. *d.* Cocoon.

mous feeders, but as they approach maturity, they develop wonderful proficiency in this line, often stripping whole orchards in a brief space of time, leaving the trees as bare of vegetation as they are in mid-winter. Having consumed the foliage on one tree they hasten to others. In some instances they have been so numerous and rapacious as to be driven by want of food to extend their travels some distance from their starting point. This species usually confine its ravages to the orchard, preferring the leaves of the ap-

ple, cherry and plum, but when these are not convenient, they thrive equally well on the bass wood, elm and some other varieties of forest trees.

As they reach maturity they wander about singly, seeking some convenient shelter in which to pass the chrysalis state. This is usually found under the rough bark of the trees, or in the fence corners or the brush or rubbish near the ground. Some take refuge in the old nests and are transformed there. Having found the desired place, the worms spin a double cocoon, the inner one of a close, firm texture, the outer of a loose and coarser fibre and a yellow color, the space between the two being filled with a yellowish fluid, which when it becomes dry resembles powdered sulphur. Here they remain between two and three weeks and then emerge as a moth.

From the first to the middle of July these moths are usually seen in the greatest numbers. The moths are of a reddish-brown color, but there is often a considerable variation in shade, some being much lighter than others; they are thick bodied, and when their wings are spread, extend from an inch and a quarter to one inch and a half. Two oblique, parallel, whitish lines extend across the fore wings, dividing them into three nearly equal parts. There is often quite a difference in the prominence of these white lines, and in some individuals the portion of the fore wing between the body and the first line is of a grayish color. The hind wings are uniform in color and about the same shade as the body of the fore wing. The female moths are nearly double the size of the male. These moths fly only at night. In the month of July they are often heard thumping against the windows in the evening, attracted by the light within. Should the window or door be open, they enter in a noisy, boisterous manner, flying rapidly about the light, and dashing wildly around the room. Their life in the moth state is very brief. In a few days after their first appearance they pair, and the female deposits the eggs for the next season's brood of worms. She usually selects for this purpose twigs of new growth of wood; they are occasionally found on the old wood, but always near the present season's growth. The eggs are laid in clusters of from two hundred to three hundred each, in a regular continuous circle, winding around the twig. The eggs are glued firmly to each other and to the twig, and the whole are covered with a thick coat of

varnish, resembling in color the bark of the tree. This varnish is an effectual protection against heat and cold, sunshine and storm, and also serves as food for the worms in case there is a scarcity when they first hatch out. To the casual observer these bands, these circlets of eggs, of a color the same as the limb on which they are situated, appear like an enlargement of the natural wood of the tree, which is very commonly seen.

It is in this state that the most favorable opportunity for their destruction is presented. From the time the trees are stripped of their foliage in the fall to the starting of the buds in the spring, these clusters can easily be discovered and removed. A moderate pressure with the thumb and finger will cause them to peel off from the limb, or the twig on which they are placed may be cut off and burned. To one bent on freeing his orchard from this pest, plenty of time during the fall and the long winter and early spring will be found to go over the trees again and again, to make the work of extermination nearly complete. A little practice will enable one looking up through the tree, with the sky for a background, to easily detect these egg clusters. A cloudy day is the best time for this work, as it is less trying to the eyes, and the light more favorable. Should this opportunity be neglected, or some of the clusters of eggs be overlooked and hatch out, another favorable time for their destruction comes when the worms are gathered in their nests. In the scanty foliage of early spring, these tiny webs are easily detected as they glisten in the sunlight. Where these nests and their contents are thoroughly destroyed, early in the season, the pest will be effectually annihilated. The time to do this is *early in the morning or late in the afternoon, and within eight or ten days after the worms hatch out.* If done in the middle of the day, the worms will be scattered over the tree, and will either spin a new web or live without one, and when left until they have entered far on the second week of their development, it is impossible to find many of them gathered at a time in these tents. Every worm in the nest should be crushed, and the most efficient instrument for this purpose is the bare hand; where a cloth, sponge or stick is used, many will escape. Where both these opportunities have been suffered to pass by unimproved, the time, the labor and expense required for their destruction is greatly increased. Their gregarious tendency, especially while moulting, can be taken ad-

vantage of to greatly lessen their numbers; but the easiest and most effectual means that can be used in these circumstances, is the application of poison to the foliage of the tree. Arsenic and Paris green can be used for this purpose, but we prefer the first one named, on account of its being cheaper, more effectual, with less danger of harm to the trees and to those using it. The best way to apply it is in a liquid form, showering the trees through a fine hose, with a small force pump; or if the trees are small, with a garden syringe. If the arsenic is of good quality, an ounce to ten gallons of water will be sufficiently strong. The best way to prepare it is to boil the arsenic in a smaller amount of water, using three gallons of water to a pound of arsenic, and then add sufficient water to secure the desired strength. Care should be taken not to inhale the fumes while boiling or in its application to the trees. If the work is thoroughly done, one application will probably be sufficient; but another may be necessary. The effects of the arsenic on the fruit will not be injurious; for the poison will disappear long before the fruit reaches maturity and were this not true, it would be far better to sacrifice one crop to save many, and perhaps the trees themselves. As the arsenic is only partially soluble, it will be necessary to stir it frequently while using and to add water when the preparation gets much reduced. If put on of too great strength, it will injure the foliage and the trees themselves. Care should be taken to thoroughly cleanse the pails, casks, etc., used in preparing and applying the mixture, before using them for any other purpose, and if the trees stand in grass, to keep out all kinds of stock until there has been one or two hard rains to wash off the grass thoroughly.

The attraction of the light might be used to good advantage to destroy the moths, and thus prevent the laying of the eggs. Nocturnal moths are all, or nearly all, injurious, and all are fascinated by the light. This fact, if properly improved, would be of great benefit in the destruction of our insect enemies. A small lantern, or, in a still night, a small open flame, placed in a tub of water, would dispose of thousands of these pests, if kept burning through their season; and, taken at this time, before they have fulfilled their mission in the perpetuation of their species, each individual represents a generation. This method is being extensively used in some sections of the country.

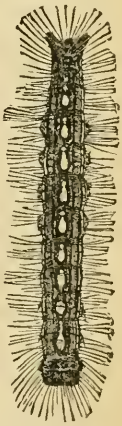
Another method by which the numbers of our insect enemies might be greatly lessened, is to employ the children in the work of their destruction. In Germany and other countries of Europe, school children are taught to distinguish the most common beneficial and injurious insects, and to collect and destroy the latter. The last season the reported destruction of the May beetle alone in the district of Segeberg, amounted to fourteen thousand one hundred and ninety-six kilogrammes, or about thirty-one thousand two hundred and fifty pounds, and also five hundred pounds weight of the grubs or larvæ of the same insect. Placing the number of beetles in each kilogramme at nine hundred and twenty, which is a fair average, the total number of this pest destroyed will amount to over thirteen millions. In addition to the direct benefit arising from the destruction of so many of our foes, this practice would create an interest in their young minds in the study of the wonderful and mysterious phases of insect life, which would lead to a better appreciation and knowledge of this important subject.

FOREST TENT CATERPILLAR.

Clisiocampa sylvatica.— Harris.

This insect, in form, habits and general appearance, resembles very much the orchard variety. In fact, so close is the resemblance, that those unacquainted with their habits and history often regard them as identical. As their depredations are mainly confined to the forests, they are not so generally known, and are not considered very injurious, or as sufficiently numerous to require much attention. But in certain portions of our state they have appeared in great numbers for the past few years, and done much harm. In some instances they have stripped hundreds of acres of their foliage, so that for miles in our heavy timbered lands the trees have been as bare of leaves in July as in midwinter. In size the worms are about the same as the *Clisiocampa Am*, but surpass them in voracity. They soon devour all the verdure of the trees where they first appear on the stage of action, and march on from tree to tree, leaving nothing but bare limbs in their track, and often finish their career a long distance from the starting point.

FIG. 6.



Forest Tent Caterpillar.

One point of difference beween the two is the fact that the forest variety prefers the foliage of forest trees to those of the orchard, but like their orchard cousins, they will devour both, where forage is scarce, or the orchard lies in their track.

Mr. Harris describes the caterpillar as "reaching its full size about the 20th of June, when it measures about two inches in length; there are a few short yellow hairs scattered over its body, particularly on the side, where they are the thickest. The general color of the whole body is light blue, clear on the back and greenish on the side; the head is blue and without spots; there are two yellow spots and four black dots on the top of the first ring; along the top of the back is a row of eleven oval, white spots, beginning on the second ring, and two small, elevated, black and hairy dots on each ring, except the eleventh, which has only one of large size; on each side of the back is a reddish stripe, bordered by slender black lines, and lower down on each side is another stripe of yellow color, between two black lines; the underside of the body is blue-black."

On first hatching out they spin a company web, but it is placed against the body of the tree or on the underside of some of the large branches, instead of the forks of the small limbs. They are gregarious in their habits, more so than the orchard species, clustering together in communities of three or four hundred each, where they often lie for hours together, especially at the time of moulting. There are four of these periods; the first occurring when the caterpillars are about two weeks old, and the others at intervals of nearly a week each. Frequently at the last moulting time they come down on the body of the tree near the ground, where they are easily reached and destroyed. At maturity they scatter in search of a place to pass the chrysalis state, sometimes drawing the leaves together and spinning their cocoons under their shelter. These cocoons resemble those of the common tent caterpillar. In about two weeks the moths appear, the female nearly twice the size of the male; the color is a reddish brown, being of a little lighter shade than those of the *Americana;* the parallel oblique lines on the fore wings are, however, dark rather than light, and the portion of the wings enclosed by them is usually much darker in color than the other sections. They lay their eggs in circular bands on the twigs of the trees, gluing them together

very compactly and covering them with varnish. These egg clusters differ from those of the orchard species in being usually larger and in their terminating with an abrupt, square shoulder, while those of the other end with a regular curve.

The same means mentioned above may be used for their destruction, though not with the same readiness or efficiency; owing to their location on the high forest trees, the egg clusters and worms in their earlier stages cannot be so easily reached, but their gregarious habits, and their torpid condition while moulting, furnish good opportunities for their destruction in large numbers. Lights at night, at the season when the moths appear, can be also used to great advantage.

YELLOW NECKED APPLE TREE CATERPILLAR.

Datana Manistra.— Drury.

In some respects this insect resembles in its habits and modes of life the tent caterpillars, and is sometimes mistaken for them by those who are superficial in their observations. Yet it is of an entirely different species, and while there are a few things in common, a slight examination will reveal a great dissimilarity between the two. The eggs from which these worms hatch are laid in clusters on the underside of the leaves at the extremity of the limbs, a hundred or more in each cluster. They usually are first seen the latter part of July, but broods continue to hatch out during the month of August, and even later in the season. At first they are less than a quarter of an inch in length and feed side by side on the under surface of the leaves, but as they increase in size they devour all the leaf except the larger stems and ribs, working down the limb on which they are located, making it completely bare. If seen in the earliest stages of its development the whole brood may be removed on a small twig and even on a single leaf. The first sign of their presence is usually a bare limb here and there on the tree, and often there is not a worm in sight, and the observer is led to think that the destroyer has completed his work and gone, but a closer look will reveal the brood gathered in a small clump on the side of the tree, lying in a semi-torpid state; they have passed through the first stage of their existence and come to the moulting period; this passed, they engage in the work of destruction more

fiercely than before, and if left undisturbed, will rapidly strip limb after limb and leave the tree bare of foliage. There are three of these moulting periods, at which times they huddle close together on the body of the tree, usually the sheltered side, where they can easily be crushed.

When first hatched out, the worms are a dusky yellow, with heads and feet black, and with four narrow yellow stripes on each side of the body. At each successive moult the color becomes darker. When it is full grown, the body is almost black; the head also is black, but the first segment of the body is a clear yellow. The four narrow yellow stripes on the side are quite distinct, and a few light-colored hairs are scattered over the body. A peculiar feature of the species is the position they assume while at rest or when disturbed. This is represented by *a* in figure 7; the head is thrown back over the body, and the hind extremity is elevated.

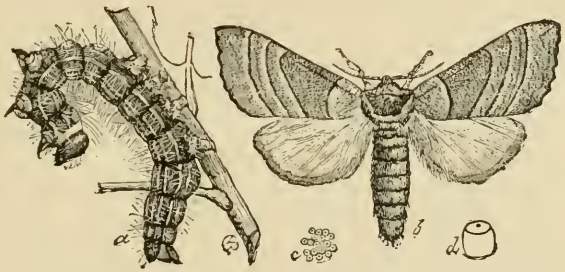


Fig. 7. Yellow Necked Apple Tree Caterpillar.

a, full grown larva; *b*, moth; *c d*, eggs.

The caterpillar state continues five or six weeks, when the worms are about two inches in length. They then crawl down the tree and enter the ground, where they remain in the chrysalis state until the following June or July, and then appear as moths. As these moths are nocturnal in their habits, they are not often seen, unless drawn by the light into the house at night. The color of the moth is a light brown, with the head and the rectangular section at the base of the fore wings of a much darker shade. The wings, when expanded, extend about two inches. The fore wings are nearly the same color with the body, and are crossed by two transverse lines of a much darker shade; the line nearest the body is strongly curved, the others less so. The hind wings are of a much lighter and uniform color.

There is a variety of this caterpillar which feeds upon the sumach, and another which feeds on the black walnut and hickory. The habits of the three are identical; the only difference is in the markings and color, which, it is thought, is the result of the plant food on which it is developed. The body of the caterpillar living on the sumach is either black or very dark red, with much broader lemon-colored stripes on the sides, while the top of the neck is black, bordered with a yellow stripe; while the caterpillar living on the walnut is wholly black, without stripes, top of the neck black, and the hairs are pure white and twice the length of the yellow-necked variety. The moth of the sumach variety has more of a yellowish cast to the wings, and those of the walnut form are of a much darker shade.

The most effectual method of destroying them is to carefully examine the trees previously infested with them, and cut off the leaf or twig when they first appear, or to crush them when gathered on the body of the tree at the moulting periods. An acquaintance with the habits of this and of all our insect enemies will aid us greatly in their destruction. Each one has some vulnerable point in its career where it can be more successfully attacked. By making ourselves familiar with them, and by taking advantage of them, many things will become plain and simple which were before hard and mysterious. One reason, and a great one, too, why insects have done so much damage to the farmer, is because of the prevailing ignorance in relation to their history and habits.

THE ARMY WORM.

Noctua unipuncta.—Haworth.

In various parts of the country there are frequent reports of great destruction occasioned by this pest; but in very many of the cases thus reported, the foe is not the true army worm. Many even who have given considerable attention to our insect enemies mistake the tent caterpillar, both the orchard and forest varieties, and also the fall web worm and the hickory worms, for the army worm. There is a marked difference in the habits and in the form and appearance of these insects, which once noticed will enable even a common observer to readily distinguish them. By reference to the accompanying cuts, many points of difference will be easily seen.

The true army worm prefers cool, moist localities. It is on the low grass lands where the eggs are usually laid, and the young larvæ pass the first two or three weeks of their existence. When the food in their immediate vicinity is consumed, they migrate to higher grounds, laying waste the grain and grass, corn, and nearly all the garden and field crops that lie along their path. It is seldom that they disturb the foliage of trees; never, in fact, except when driven to it by the scarcity of other food. When pinched by hunger they will even devour one another.

Both the moths and the larvæ are to be found every year in greater or less numbers, but a very wet season following an excessively dry one, is most favorable for their development. This peculiarity is so marked, in fact, that in localities which have been overrun with them years before, with such a combination of extremes, their appearance can be predicted with great certainty. It is mainly owing to this fact and to the rapid development of their parasite foes, that they are never very troublesome two years in succession.

The moth (figure 8) of the army worm is of the nocturnal or night-flying species, nearly all, if not all, of which are destructive to vegetation. There is some variation in the color of the moths, but they are usually of a reddish-brown or fawn color. The body is thick-set and compact in form; the abdomen tapers off quite rapidly and ends in a tuft of short hair. A pair of antennæ, or feelers, extend out from near the head, parallel with the front line of the fore wing. It has two pair of wings, set well forward on the body. The fore wings are long and narrow, the front lines of which make a somewhat acute angle with the head and body, and the outer points of which are slightly curved back. Through the middle of the fore wing runs a prominent vein, which at the center of the wing divides into three smaller veins. At this point of division is a small spot of a dusky white color, which gives the moth the distinctive name of *unipuncta;* there are also lines of darkly-shaded red spots crossing the fore wings, which gives them a dotted appearance. The hind wings are much shorter, broader, thinner in texture, and of a lighter color than the fore wings. The color of both wings is somewhat lighter on the under side than the upper. When full grown, the wings expand from one and a half to an inch and three-quarters, and when the moth is at rest the hind wings are

partially folded and laid upon the abdomen, and the fore wings overlap them in the form of a roof.

Their flight is strong and swift, and mainly confined to the night time. They are often drawn in large numbers into the houses in the evening, being attracted by the light within. When disturbed in the day time, they dart out from their place of concealment, and with a rapid flight quickly seek shelter again.

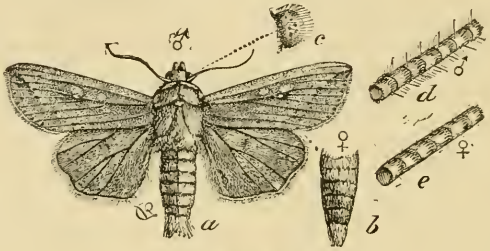


FIG 8. ARMY WORM MOTH.

In the accompanying figure 8, *a* represents a male moth, natural size; *b*, the abdomen of the female; *c*, the eye magnified; *d*, the base of the male antennæ, and *e*, the base of the female antennæ, enlarged.

The army worm is usually regarded as single brooded, especially in the more northern states, but the fact that the moths are seen often early in the spring, and again in much larger numbers later in the season, usually in this section, in July and August, would lead us to conclude that there are sometimes at least two broods of moths, and probably of worms, a year. Moths are usually short lived, and it is hardly to be supposed that those seen early in the spring continue through the season, or that those developed in the fall pass unharmed through our severe winters. Those seen early in the season, doubtless, passing the winter in the pupa state, come out about the time the grass starts in the spring, and lay their eggs, which hatch out about the same time with those laid by the fall brood of moths.

These eggs are deposited on the grass in the low bottom lands, near the ground, "usually," Professor Riley says, "along the inner base of the terminal blades, where they are yet doubled; the ovepositer of the moth is thrust in between the folded sides of the blade, and the eggs are glued along the groove in rows of from five to twenty, and covered with a white, glistening, adhesive fluid, which not only fastens them to each other, but also draws the two sides of the grass blade around them." As soon as the weather be-

comes quite warm in the spring, and vegetation starts freely, these eggs hatch out. Where they are laid in the spring, if the weather is favorable, the worms make their appearance in eight or ten days after the eggs are deposited.

The young larvæ are exceedingly voracious, and eagerly enter upon their mission of destruction. Their development is very rapid. In from two to three weeks they grow from less than a line, to an inch in length. At first the color of the body is a light green, with a dark, almost black head. They pass through five moulting stages, at intervals of about three days each, and with each successive change the color becomes darker. When mature the color is very dark; there is a broad dusky stripe along the back, with alternate narrow, faint white, yellow and black lines on the sides. Underneath, the color is a bright green.

When mature the worms are about an inch and a-half in length, and the body is divided into thirteen rings, which become more contracted and wrinkled at each end, and are sparsely covered with short hairs. It has three pair of fore legs, and five pair of pro legs, which are tipped with black.

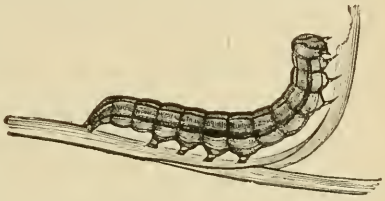


FIG. 9. MATURE ARMY WORM.

When they have exhausted the food of the locality in which they originated, they march in serried ranks, in long deep columns, wherever their instinct leads them. It is this form of march which gave rise to their name. Nothing will avail to change their course, and nothing short of annihilation will stay their onward march. Wherever they go vegetation melts like the dew. Usually they feed in the fore part of the day, and in the evening, but sometimes keep up the work of destruction through the entire night. In many cases they have in a single night stripped off every green leaf, and eat up every head in large fields of grain. During the last three or four days of their existence, they are much more destructive, and devour more in that time, it is said, than in all the rest of their career.

On reaching maturity they vanish more suddenly, if possible, than they came; not one can be found where a short time before there were myriads on every side. To those not acquainted with their habits, their sudden appearance in an almost mature state,

and more sudden departure, seems mysterious and unaccountable; but the first is due to their being confined to the low lands in the early stages of their growth, and to their minute size and close resemblance in color to the vegetation on which they feed; and the other to the fact, that when the development of the larvæ state is complete, they burrow in the ground and pass into the pupa state. Here they spin a cocoon of a dark mahogany color, and go through the chrysalis development in from two to three weeks, and then make their appearance as moths.

Were it not for natural causes there would doubtless be such an increase in their numbers and destructiveness as to be fatal to vegetation throughout large portions of the country, but they are held in check by many parisitic foes, and by unfavorable seasons. Much may be done to add to the work of destruction by natural causes, by the use of artificial means. Burning over the meadows late in the fall or early in the spring would destroy the eggs deposited in the fall, and prevent the laying of the eggs in the spring, or compel the moths to select other fields for this purpose not suitable for their development. The attraction of the light at night would aid in the destruction of the moths of this and many other injurious insects. A candle in a still night, or what is better, a lantern, placed over a dish or tub of water, would lure to their destruction hundreds and thousands. A fire will not answer the purpose, as heat and a great blaze serves to drive them away; a small blaze is all that is needed.

When the worms are on their march, the best means of staying their work of destruction is to dig ditches across their course; coming to them they fall in and are unable to crawl up the sides where cut nearly perpendicular. Here they can be crushed, buried or destroyed in various ways. Such is their dogged perseverance in carrying out their line of march, that they will press on and fall into the ditches to the last individual or until the ditches are full.

FALL WEB WORM.

Hyphantria textor. — Harris.

This is another insect which is frequently mistaken for the tent caterpillar. It is true that they have similarity in taste, infesting the same kind of trees, and also in the fact that both spin and inhabit

webs, but beyond this, they have nothing in common. Their habits are different, their markings and life history all are different, yet some who have noted this dissimilarity still cling to the opinion (or are inclined to) that it is the second brood of the tent caterpillar, and that the variations result from natural causes; but there is no ground for this supposition. They are of entirely different species.

The moth usually appears in June and July; some earlier and others later. The wings are pure white, and when spread, expand an inch and a quarter or over. The legs and lower portion of the body have a yellow shade. The eggs are laid in clusters on the leaves; generally near the extremity of the branches. These eggs hatch out from time to time, during June, July and August, and the

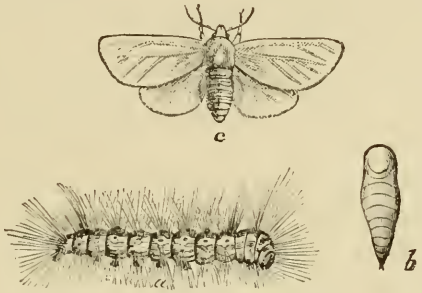


FIG. 10. FALL WEB WORM.

a. Full grown larva. *b*. Chrysalis. *c*. Moth.

young worms commence at once to enclose the leaf with a web, each one joining in the work. It is this peculiarity that gave rise to its generic name, *Hyphantria textor*, "the weaver." Under the shelter of this web they feed on the pulpy portion of the leaf. As the leaves enclosed in this shelter are consumed, they extend their web from time to time, and often enclose the entire limb on which they are located. Here they may be found at all times before they arrive at maturity. They seem to thrive on most every kind of tree and shrub. Their unsightly webs may be seen on the tall forest trees and the oak grub. The apple, the elm, and the cherry trees, however, seem to be their favorite habitat; on them their webs are more numerous and attain a larger size.

When young the larvæ are of a light yellow color; head black, and a few brownish hairs scattered over their body. When mature,

they are a little over an inch in length, and generally of a pale yellow color, with a broad dusky stripe along their back, and a yellow stripe on the sides. There is, however, a considerable variation in color, seemingly the result of the food on which the insects live. Those on some kind of the oak are of a bluish or black color, with the stripes on the side of a much paler shade. On each segment are found quite a number of warts or tubercles, from each of which is developed a small group of whitish or gray hairs, with a few black ones here and there, growing out at different angles. The tubercles along the back are colored black; those on the side, orange. When the worms reach maturity, they separate, each one seeking a place to pass the pupa state, feeding on various plants as they wander about. On finding the desired shelter, they spin a thin and almost transparent cocoon of silk, in which they hibernate, and are transformed to moths in June or July. Dr. Harris says they form their cocoons in crevices of the bark and other sheltered places above ground, but according to Prof. Riley they usually go into the ground to pass the chrysalis period. Some of the earlier broods of worms have been known to mature, pass the pupa state, and develop into moths in time to perfect a second brood the same season; but this is generally regarded as exceptional, and that the species is single brooded, the different degrees of development seen at the same time being the result of natural causes operating to lengthen or shorten the period of hybernation.

Their habits naturally suggest the most efficient means for their destruction. Until they reach maturity they never leave their webs; all may be found at home; if these webs are cut off and destroyed, the work of extermination will be complete. This should be done for the good of the orchard, and for the credit of the owner. These unsightly webs are an eyesore to the thrifty farmer; and in the public estimation, like the prostrate gate, the blind hanging by one hinge, they are regarded as a sure indication of a shiftless owner.

TUSSOCK MOTH.

Orygia leucostigma.

During the winter season may be seen, here and there, a single dry leaf, or a small cluster of leaves, hanging as if caught there by chance, to the under side of a limb or twig of the apple, pear or

plum trees. If noticed at all, the casual observer would pass them by without thought of any object or purpose in their position, but a slight examination shows that these seemingly harmless dead leaves are held securely in their places by firm silken cords, and on parting the leaves, while some will be found to contain only an empty cocoon, in others will be found, in addition to the old shell, a mass of small round eggs, arranged in a somewhat irregular form, but of a pyramidal shape, so as to present a convex surface to the weather. These masses each contain from 350 to 500 eggs, nearly round in form and white in color. These eggs are firmly glued to the cocoon and to each other by a frothy, gelatinous looking substance, which was evidently deposited with them in a fluid state. The whole mass is also covered with the same substance, presenting a smooth surface, impervious to water. Early in June these eggs begin to hatch. Unlike many of our insect enemies, they do not all hatch out at the same time, but different clusters in different parts of the orchard hatch out at intervals extending through two or three weeks. The same irregularity is also manifest in their after development; for, as Mr. Riley observes, "some of the same brood, hatched out on the same day, will have produced moths, while others are yet feeding in the caterpillar state." When it first appears, the larva is about an eighth of an inch in length, and of a grayish color; head of a reddish brown. Each segment or ring has a number of tubercles, from which protrude clusters of hairs, varying greatly in length and extending in different directions. In about seven days the larva casts off the old skin and the hairs become more numerous and longer, and the colors brighter. This is followed with two other moulting periods with the male larvæ, and three with the female. When full grown, the female larva is over an inch long; the male about three-quarters of an inch; the head is a bright red; the back, of a velvety black; the main part of the body, of a bright yellow or orange color, with yellow hairs scattered along its side.

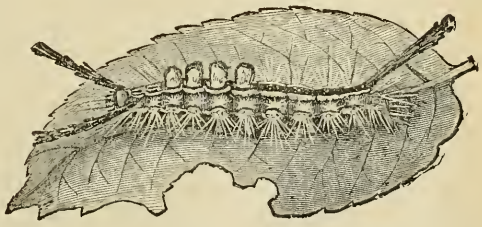


Fig. 11. Full-Grown Tussock Caterpillar

From the first segment two long tufts of black hairs extend for-

ward, and a similar tuft from the ninth segment, pointing back. On the second, third, fourth and fifth segments are placed cream colored tufts of yellowish hair, and on the ninth and tenth are two little red tubercles, or warts.

The following description of the moths is given by the Rev. C. J. S. Bethune, in the Ontario Fruit-Growers' Report: "These caterpillars feed singly on the leaves of apple, plum, and a large number of other trees, doing a great deal of damage when numerous. When full grown they spin their silken cocoons on twigs of the trees which they frequent, or on fences; in the former case they draw down a leaf as a covering, and firmly attach it to the cocoon. The male cocoon is white, or yellowish, and so thin as to show the insect through it; but the female cocoon is twice as large and much more firmly constructed, of a darker color, and contains a different shaped and a much larger chrysalis. The insect remains about a fortnight in the chrysalis state, and then comes forth in the form of a moth. The male has broad ashen-gray wings, which expand about an inch and a quarter. When at rest, it is heart shaped. The fore wings have a few indistinct black lines across them, and a white, crescent shaped dot near the lower corner; the antennæ are heavily and beautifully feathered, the tips of the plumes bending forward and approaching each other. The female, on the other hand, is extraordinarily different, and would never be suspected of laying claim to the title of a moth; she has the merest rudiments of wings, which are not observable except on close inspection, and a thin, simple antennæ; in fact, she is more like an animated bag of eggs than anything else. Being unable to fly, she remains on the cocoon, where she is found by her mate; after pairing, the female lays her eggs on the cocoon, and her work being accomplished, drops down and dies."

FIG. 12. MALE TUSSOCK MOTH.

As, like the canker worm, the female moth is wingless, their distribution is comparatively slow. Also, like the canker worm, when disturbed they let themselves down by a web, and are doubtless caught in this way by teams and passers-by and carried to other places, where they find congenial food, complete their development and form new colonies. They are also doubtless spread by means of egg masses on young trees, brought from places infested with

them. Special care should be taken to examine all young trees carefully, and to destroy the eggs and prevent the spread of this pest. When they have got a foothold, advantage may be taken of their suspending themselves with a web when the tree is slightly jarred. But the surest means for their destruction is the crushing of the clusters of eggs on the trees in the winter season. The tell-tale leaf will readily direct one on the lookout, and who knows its significance to the threatening evil. Mr. Riley says he has discovered nine parasites which do us efficient service in keeping this foe in check, and strongly urges the destruction of those cocoons only that contain masses of eggs, as the others are harmless male cocoons or contain parasite friends, which, if spared, will destroy many of those that escape our notice.

THE RASCALLY LEAF-CRUMPLER.

Phycita nebulo.

This insect was first discovered and named by Prof. Walsh, state entomologist of Illinois, in 1860. It infests both the apple, the cherry, the plum and crab-apple. Its numbers are much larger than is generally supposed, and the damage done by them is also much under-estimated. This is owing largely to the fact that they do not work in communities, but are scattered one or two in a place all over the trees. At the season when they are the most ravenous in their work of destruction the trees are in full foliage, and though they may exist in large numbers, they escape notice unless a very careful examination is made. Some seasons and in certain localities they are so numerous as to destroy nearly all the fruit and foliage in large orchards. The past season the orchard on the lake shore, on the University farm, was very much injured by them. Most of the trees in the orchard on the northern slope were so much infested with them that the color of the foliage was changed from a bright green to a dull, withered, ashy color, and on close examination the extent of the mischief done by them could be seen in the loss of vitality in the leaves and in the destruction of nearly all of the fruit. This insect, like the one last described, passes the winter on the trees, under the protection of a clump of dry leaves, bound securely to the twigs by silken cords, but the two can be very easily distinguished. In the one,

will be found masses of eggs attached to an old cocoon, in the other a brownish colored worm enclosed in a twisted, hornlike case, large at one end and tapering to a point at the other. Sometimes the dried leaves are found bound tightly to the twig, as is represented by *b* in Fig. 13; in which case the sheath enclosing the larva is generally found glued to the twig itself, the bark being gnawed off where the attachment is made. In others the leaves hang more loosely, and in the worm-inhabited cases may be found sometimes two or more curled up within and fastened with silken cords. In this way the worms go into winter quarters when about one-third grown. As the leaves appear in the spring, they move from the old quarters and form a new shelter of fresh leaves and continue their work of destruction, coming out of their case to feed, generally in the night. It not only eats the leaves, but often gnaws the fruit, imbedding itself in the side of the apple; it also gnaws the tender bark of the twigs, and eats out the buds. This case to which it retires for shelter when not feeding or when danger threatens, is made of the excrements of the worm and the refuse of the leaves on which it feeds, interwoven and lined with silk.

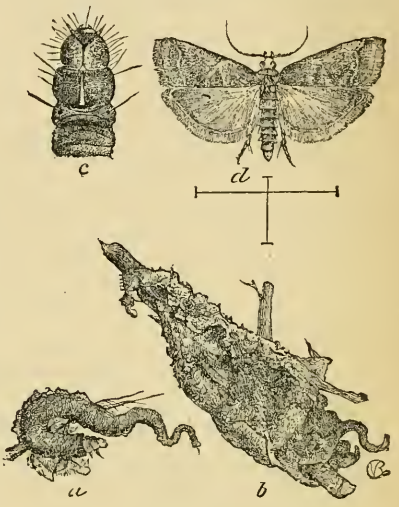


FIG. 13.
RASCALLY APPLE-LEAF CRUMPLER.
a. Case for shelter; *b*. dry leaves containing case; *c*. head and first segment; *d*. moth.

The worm, when fully grown, is about six-tenths of an inch in length; its head, represented by *c*, Fig. 13, is a dark, reddish brown, covered with a horny-looking plate, which also extends over part of the second segment. The brown color of the body during the fall and early spring, now changes to a dark green on the back, with a lighter shade underneath. On the side of the second and third segments, there is a small black protuberance, and a small black spot on the side of each of the other segments, each of which contains a single light brown hair. It usually passes into the pupa

state early in June, generally in the case which has been its home while feeding; but they have been known to pass the chrysalis state on the outside of this case. In a little less than two weeks the chrysalis develops into a moth. "The wings of the moth measure, when expanded, about seven-tenths of an inch. Its body is about three-tenths of an inch in length. The fore wings are pale brown, with patches and streaks of silvery white; the hind wings are plain, brownish white; the under side of both wings is pale, whitish brown, but the hind wings are paler than the fore wings." These moths lay the eggs for the next brood on the leaves of the trees best adapted to the taste of the worms; these eggs hatch out late in the summer; the young larvæ feed during the fall, construct their cases, provide a shelter of dead leaves, and go into winter quarters when about one-third grown, as stated above.

From the foregoing description of the habits of this pest, it will be readily seen that the time best adapted for its destruction is while in its winter quarters, as the dry leaves on the bare trees plainly indicate where it may be found. As it is single brooded, if this work is thoroughly done, one season will secure their extermination. Prof. Riley and others recommend that instead of crushing and otherwise destroying these dry leaves when gathered, that they be put in a box and taken to some place where there are no trees near, and the worms will then wander about for a short distance and soon perish for want of food, and the ichneumon flies and other parasites which prey upon them, will mature and continue their friendly services in our behalf. The application of arsenic, Paris green, English purple, and other poisons, would probably kill many of them while feeding upon the leaves, but no application of this kind will reach them, to kill by contact, while sheltered in their cases.

The Round Headed Apple Tree Borer.

Saperda bivittata.—Say.

This insect was first discovered by Say, in 1824, but for many years very little damage was done by it in the orchards. It is supposed to be a native of this country, and to have, for a long period, preyed upon the wild fruit trees. When cultivated orchards increased in number and size, they commenced their attacks on the

cultivated apple tree, and finding the food especially adapted to their wants, they increased rapidly, and soon became one of the greatest foes of the apple. The fact that, silently and unseen, they are eating out the heart of the orchard, and their work of destruction is often nearly complete before their presence even is known, makes them a foe more to be dreaded. Trees on high and dry locations are more exposed to their attacks than others. The failure of many trees in our orchards, which is usually attributed to other causes, is doubtless largely due to the insiduous working of this pest and its co-partner in destruction, the flat-headed borer. It is a very common cause of complaint that trees kill themselves by over-bearing, when the cause of this extreme fruitfulness is the gnawing away of the heart by these destroyers, and the whole energies of the tree are thrown into a last effort to perpetuate its species.

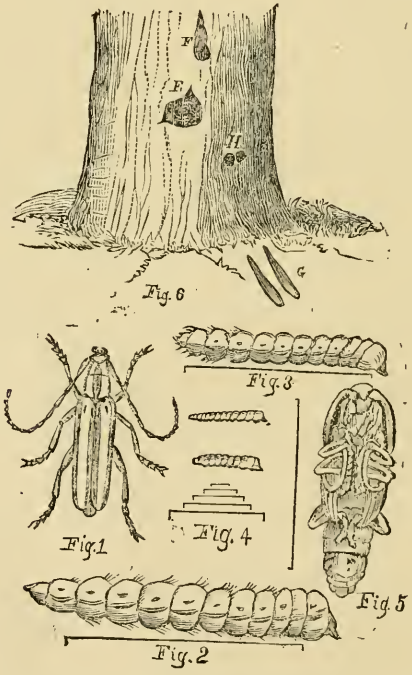


FIG. 14. ROUND HEADED APPLE TREE BORER.

The perfect beetle is seldom seen, as it hides during the day and flies only at night. When once seen it is easily distinguished by

its peculiar markings. It has two clearly defined stripes of chalk white, running from its head to the extremity of its body; its antennæ are long, slender, and bend backward, with a sharp curve forward near the extremity. The face, underside of the body and legs, are also white. Its length is about three-quarters of an inch. They appear during the months of June and July—some earlier, some later. The female beetle soon lays her eggs upon the bark of the tree, near the ground. In about two weeks these eggs hatch, and the young worm commences to drill into the bark, crowding its castings out behind it. A careful examination of the trees during the fall of the first season, and the greater part of the second, will reveal their castings, and unerringly make known the location of the larvæ.

The second year it bores into the sap wood, cutting in no given direction; sometimes striking in toward the heart, at others running up or down, and yet again passing around the tree, girdling it by cutting off the sap wood. The third year they generally take an upward direction, either striking through the heart wood to the other side of the tree, or bending outward, in order to bring the upper end of the gallery to the outside bark. Here, at the close of the third season, the occupant closes the passage in front and rear, by packing it firmly with refuse and saw dust, and lies during the winter in a torpid state. In the spring it enters into the pupa state, and soon becomes a perfect beetle. In a short time the beetle tears away the saw dust at the upper end of the hole, and cuts its way through the bark. Figure 14 shows the perfect beetle; the pupa; the larvæ in different stages of its growth; the holes where it enters and leaves the tree.

The Flat Headed Apple Tree Borer.

Chrysobothris femorata.—Fab.

The natural habitat of this insect is supposed to be the oak, from the fact that it is sometimes found in great numbers in diseased trees and old decaying stumps of the white oak, but it also works in the soft maple and other forest trees, as well as various kinds of cultivated fruit trees. In many places it is even more destructive to the orchard than the round headed borer. This beetle belongs to the Buprestidæ family, an entirely different family from the one

last described. In the months of June, July and August, they may be found, on the south or southwest side of the trees, basking in the sunshine. The color of the upper side of their body is a greenish black, flecked with patches of gray, while the under side is a bright copper color. Its length is about half an inch, but there is considerable variation in this respect. It flies by day, and is very active in its movements, darting away swiftly when attempts are made to capture it. As it closely resembles the bark of the tree in color, it cannot be easily detected when at rest on the tree, without special attention is directed to it. The eggs are generally laid either singly, or two or three in a place, in the cracks or crevices of the bark, or under the rough scales on the southwest side of the tree, either on the body of the tree, or at the crotch. Trees that are diseased, or that have been injured, are much more liable to be attacked. The worm, as it hatches and burrows in the bark, lives in the early stages of its growth on the inner bark and sap wood; as it increases in size and strength it cuts its way into the solid wood, sometimes eating through the heart wood. The full grown larva is described by Professor Thomas, as "about seven-tenths of an inch in length. It is soft, flesh like, and of a pale, yellow color. The head is small, and immersed into the following segment. The jaws are black. The third segment is very broad and large, being nearly twice the width of any of the posterior segments; it is rather broader than long, having on the upper side a large, oval, callous like elevation, covered with numerous brown raised points." It usually works in an upward direction, cutting an oval gallery, twice as broad as high. In this the larva is always found, with its tail bent around toward its head, in the position shown in figure 15. It remains in the tree nearly a year; passes the pupa state in its hole, at the upper extremity, near the bark. In June or July the perfect beetle cuts its way through the bark, basks a few days in the sunlight, performs its mission of perpetuating its species, and dies.

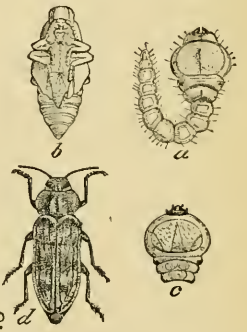


FIG. 15. FLAT HEADED APPLE TREE BORER.
a, full grown larva; *b*, pupa; *d*, perfect beetle.

The remedies usually employed to ward off and destroy both these borers, are: first, smearing the trees with some substance

which is repulsive to the beetle; and second, the knife. Soap or some form of alkali is generally used for this purpose. It should be applied two or three times in a season (and oftener if washed off by heavy rains), both to the body, the crotch and larger limbs, especially if diseased or injured in any way. Some recommend placing a piece of hard soap in the crotch of the trees, where the rain will wash it down to the places needing protection. A careful examination of the trees in the fall and spring will reveal those that are affected; the rusty colored castings of the worms, ejected from their holes, will indicate where they may be found, and in the fall especially, they can be easily removed, being near or still in the bark. The bark over their burrows is usually shrunken, dry and discolored, and is another way in which their position may be detected. In the spring, further indications of their presence may be seen, and the knife used to destroy them. If they have cut far into the tree they may be reached and killed by a wire, or what is better still, a small round piece of whalebone, so flexible that it will follow the crooks and turns of the holes. While the destruction of the mature larvæ will not repair the damage already done, it will be beneficial in preventing their contributing to the perpetuation of the species.

Many of these worms are yearly destroyed by the different species of woodpeckers. Were it not for their aid in holding the borers in check, our fruit, and many of our forest trees, would soon be annihilated. The species commonly called sap sucker, is regarded as causing much injury to the trees, by drilling the bark full of holes. This is doubtless a detriment to the tree, but the purpose for which these holes are made is not to suck out the sap of the tree, as many suppose, but the destruction of insects infesting the bark and sap wood. These birds seldom, if ever, attack a sound, healthy tree. Their instinct, or keenness of vision, unerringly directs them to the trees and places affected, and their natural appetite leads them to seek out and destroy the destroyer. Nature designed them for this work, as may be seen in the sharp, long bill, for penetrating bark and wood, and the long, wiry tongue, the point thickly covered with hooked barbs, which is run up the burrow made by the worm in search of its occupant. The instrument most suitable and best fitted for this work in the hands of man, is one made of whalebone, and is fashioned after, and does

the work in the same manner as the woodpecker's tongue. On the other hand, it will readily be seen to be wholly unfitted for the extraction of sap or fluids. A quotation from the remarks of Mr. Wilson, the celebrated ornithologist, will not only help to correct the wrong impression which many entertain in relation to these birds, but will give some idea of the benefit derived from their work: "Of all our woodpeckers, none rid the apple tree of so many vermin as the Downy woodpecker, digging off the moss which the negligence of the proprietor had suffered to accumulate, and probing every crevice. In fact, the orchard is his favorite resort in all seasons, and his industry is unequaled and almost incessant. In the fall he is particularly fond of boring the apple trees for insects, digging a circular hole through the bark, just sufficient to admit his bill; after that, a second, third, and so on, in pretty regular, horizontal circles around the body of the tree. From nearly the surface of the ground up to the first fork, and sometimes far beyond it, the whole bark of many apple trees is perforated in this way, so as to appear as if made by discharges of buck shot, and our little woodpecker is the principal perpetrator of this supposed mischief. I say supposed, for, so far from these perforation of the bark being ruinous, they are not only harmless, but I have good reason to believe, really beneficial to the health and fertility of the tree. In more than fifty orchards, which I have myself carefully examined, those trees which were marked by the woodpecker (for some trees they never touch, perhaps because not penetrated by insects) were uniformly the most thrifty, and seemingly the most productive. Many of these were upwards of sixty years old, their trunks completely covered with holes, while their branches were broad, luxuriant, and loaded with fruit. The most common opinion is, that they bore the tree to suck the sap, and so destroy its vegetation, though pine and other resinous trees, on the juices of which it is not pretended that they feed, are often found equally perforated. Besides, the early part of spring is the season when the sap flows most abundantly, whereas it is only during the months of September, October and November that woodpeckers are seen so indefatigably engaged in orchards, penetrating every crack or crevice, boring through the bark; and what is worth remarking, chiefly on the south and southwest sides of the trees, for the eggs and larvæ deposited there by the countless swarms of sum-

mer insects. Here then, is a whole species, I may say genus, of birds which Providence seems to have formed for the protection of our fruit and forest trees from the ravages of vermin, which every day destroy millions of these noxious insects, that would otherwise blast the hopes of the husbandman; and yet they are proscribed by those who ought to have been their protectors, and incitements, and rewards are held out for their destruction. Want of adaptation for this method of seeking sustenance should be sufficient to clear these benefactors from the charge of extracting the life of trees; but in addition to this, we have the evidence of those who have examined the stomachs of the birds themselves, and thus by the sacrifice of their lives, compelling them to testify to the falsity of the accusation made against the species. Dr. Bryant stated before the Natural History Society of Boston, Mass., "that he had examined the stomachs of six yellow billed woodpeckers, sent to him from Wisconsin, charged with doing great damage to orchards here, in all of which he found portions of the inner bark of the apple tree, but also much greater quantities of insects; that in one bird he found two larvæ of a boring beetle, so large that there was not room in the stomach for both at once, and one remained in the lower part of the œsophagus;" and he adds: "If these were the larvæ of the sarpeda, as is probable, they would do more damage than twenty woodpeckers, and I sincerely hope that these birds are not to be exterminated, unless it is clearly demonstrated that the injury caused by the destruction of the bark is not more than compensated by their destruction of noxious insects."

Steel-Blue Beetle.

Haltica Chalybea.

This beetle has long been known to the grape growers of the country as very destructive to the vineyard. It has done but little damage in this state, compared with its work in other sections, yet it seems to be on the increase here, and has occasioned more loss the present season than in any previous year. If care is taken to destroy them when few in numbers, they will probably never be so numerous as to prove very destructive, but if neglected, they will doubtless become very troublesome.

Though commonly called the steel-blue beetle, they differ much

in color, varying from shades of purple to dark green and blue. We find the following in relation to this insect, in an address given by Dr. J. Fisher, of Fitchburg, Mass., before the Massachusetts Board of Agriculture: "It has a most beautiful, brilliant, greenish blue color, and a very shiny shell. It is the size of a small lady bug, and somewhat the same shape, only a little more oval. It appears very early in the spring, before the leaves of the grape have shown; and, just about the time the buds begin to swell, this inect bores a small hole right in the side of the bud, takes out the

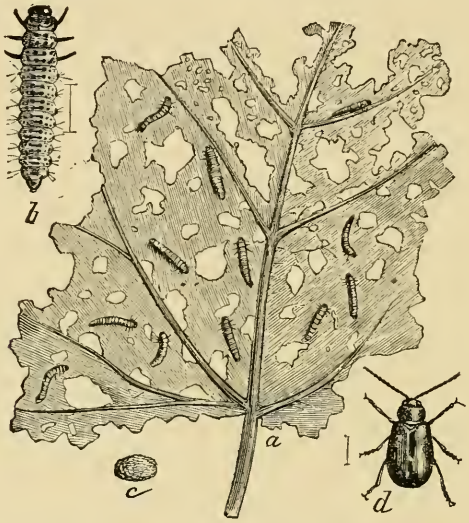


FIG. 23. STEEL BLUE BEETLE.

center, and prevents it from developing, using so much for food. They come in considerable numbers, and pair immediately on meeting their mates, eating what little they want, and destroying a bud every time they eat. They lay their eggs upon the foot stalks of the leaves, or at the base of the protruding shoot, remain about for some time and disappear. From the eggs that are laid are hatched small, brownish, nearly black, slugs or worms, that feed on the upper or under surface of the leaf, without much choice, gradually growing with the leaves; the different broods lasting, perhaps, six weeks, when they all disappear. Sometimes they are very plenty. They have been so numerous in some gardens, as to destroy the crop completely, and any grower is liable to have them overrunning his vines, if he does not keep on the watch. It is my

custom, when the buds begin to swell, to go and look, especially upon the outer rows. They do not appear to hibernate in the vineyard itself, but upon the adjoining grass ground, or other substances about. Their color is so brilliant that you cannot mistake it with any reasonably sharp eyes; it is strongly in contrast with the brown color of the wood on the vines. It is easy to see them, and you have only to crush them with your finger to make an end of them. If it is cool weather, it is very easy to put your finger on them and kill them; if it is along toward the middle of a warm day you cannot do it, for, when you put your finger where he is, he is not there, and if you are not acquainted with his habits, you do not know where he has gone. There is a kind of magic about it; but if you have watched him before, when you put out your finger, you will see him drop toward the ground; but just before reaching it he frequently makes a rapid turn, and drops down one or two feet from where he appeared to be falling; and, unless your eye has followed him down in his course quite to the ground, you can scarcely ever succeed in capturing or discovering him. The proper way is, when you come upon him, to put your left hand under him first, and then put your finger upon him. If he drops, you have got him in your hand. If the female has succeeded in laying her eggs before you capture her, you will soon find the larvæ upon the leaves. These should be killed with the thumb and finger."

The larvæ on reaching maturity descend to the ground, which they enter, and form little cells of earth, where they remain about three weeks, and then issue as beetles. These beetles are supposed not to breed again the same season, but to live on the leaves of the vine during the summer and fall, and then pass the winter in a torpid state under the weeds, grass or other rubbish on the ground, or under the bark of the posts used for trellises. It is stated that the larvæ may be killed while feeding on the leaves, by sprinkling the vines with lime.

The Radish Fly.

Anthomyia radicum.—Harris.

Early in the spring, soon after the first sown radishes have come up, a small fly, resembling somewhat the common house fly, may be seen flitting around the bed, often lighting on the ground near the

young plants, or on the plants themselves. If a careful examination is given, it will soon appear for what purpose they are drawn thither; small, oval, and white eggs will be seen on the stems of the plants, or on the ground near at hand. These eggs soon hatch out, and the little maggots make for the stem of the plant, work their way down to the root, and burrow and feed upon it. Sometimes they attack a plant in such numbers as to kill it; but if it continues to develop, it is unfit for use. It is a serious pest to market gardeners and those who raise quantities of radishes, using the same land from year to year. They are much more numerous and destructive on old ground than on new. Where once they become established, they attack alike the radish, the early turnip and early cabbage. Often in old gardens they will attack early cabbage plants in such numbers as to destroy the entire crop, leaving hardly a plant in large fields. It has been said that the worms feeding on the radish, cabbage and turnip, are different; that each is a different species; but the indications are that they are identical; what little difference, it is claimed, may be discovered in each, can readily be accounted for in the effect of the food plant. It is stated that the maggots found on the cabbage are larger than those on the radish, and that the fly is larger and of a different shade; but the form and the markings seem to be identical. Dr. Harris describes the fly as "of an ash-color, with a silvery gray face, copper colored eyes, and a brown spot on the front of the head; with faint brown lines on the thorax and a longitudinal black line on the abdomen, crossed by narrow lines." They are somewhat smaller than the common horse fly, and of a lighter color, with a metallic luster. When expanded, the wings are proportionately longer, but when at rest they do not expand as much as those of the house fly. There is quite a difference between the appearance of the male and the female. The male has much larger eyes, occupying most of the surface of the head and coming nearly together on the crown; while in the female "they are widely apart, with a broad black stripe between, which is shaded into a chestnut color in front. The hind part of the body is more conical in the female than the male." The male fly has more of a metallic luster, and its body and legs are more thickly covered with bristles. They often gather around the flowers, and at times may be seen in crowds sporting in the air. The pupa is of a reddish brown color,

oval in shape. They are supposed to pass the winter both in the pupa and fly state.

Very early sowing is recommended as a preventive. This may be, in a measure, effectual with radishes, but would be of little avail with early cabbage, as they will attack, and when in large numbers will destroy quite large plants. A frequent change of ground, each time selecting a site as far removed from the old bed as possible, is said to lessen the damage done by them. The use of hot water is also recommended; also salt and salt water, and lime; but the probable result of their application would be, that unless these remedies are used when the eggs and maggots are at or very near the surface, the application sufficient to kill the pest would also kill the plant. Those who have used lime water, however, say that while it is inimical, even in a solution of moderate strength, to insect life, it is comparatively harmless to vegetation. A more laborious, but yet an effectual remedy, would be to pull up and destroy every plant infected with them. These plants are worse than worthless, as the only purpose they can serve is to bring to maturity the enemy who will destroy the hopes of the next season. If this is done promptly as soon as the plants show signs of injury, and is followed up faithfully, their numbers will be greatly diminished, and in two or three seasons the pest will be nearly exterminated.

New York Weevil.

Ithycerus noveboracensis.—Forster.

Fortunately, this foe to the apple tree, which is doing much damage in orchards east and south of us, is comparatively little known in this state; but the indications are that it is rapidly increasing in numbers where it has obtained a foothold, and that it will become as well known and as destructive as the codling moth and curculio. In the past two years, many trees in orchards in Grant and Iowa counties have been seriously injured by them. Were but a small part of the care and labor given to their destruction on their first appearance which will have to be given yearly should they ever become established, they might be exterminated, or be so held in check as not to extend their field of operations or prove

very destructive. The following is the description given of it by Prof. Riley: "The large gray beetle, represented by *c* in the accompanying cut, often does considerable damage to fruit trees. * * It kills the twigs by gnawing off the tender bark in the early part of the season, before the buds have put out, and later in the year it destroys the tender shoots which start out from the old wood, by entirely devouring them. It eats out the buds, and will also frequently gnaw off the leaves at the base of the stem, after they have expanded. It attacks, by preference, the tender growth of the apple, though it will also make free with that of the peach, plum, pear or cherry, and also of forest trees. It is the largest snout beetle which occurs in our state, and with the rest of the species belonging to the same genus (Ithycerus — straight horn), it is distinguished from most of the other snout beetles by the antennæ or feelers being straight instead of elbowed or flail shaped, as they are in the common plum curculio. The specific name, *noveboracensis*, which means "of New York," was given to it one hundred years ago because it was found in that state. * * * The general color of the beetle is ash-gray, marked with black, as in Fig. 16, *c*, and with scutel, or small semicircular space immediately behind the thorax, between the wings, of a yellowish color. Its larval habits were for a long time unknown, but a number of years ago I ascertained that it breeds in the twigs and tender branches of the burr oak, and have good reason to believe that it also breeds in those of the pignut hickory. The female, in depositing, first makes a longitudinal excavation with her jaws (Fig. 16, *a*), eating upwards under the bark towards the end of the branch, and afterwards turns around to thrust her eggs in the excavation. The larva (Fig. 16, *b*) hatching from the egg is of the usual pale yellow color, with a tawny head. I have watched the whole operation of depositing, and returning to the punctured twig a few days after the operation was performed, have cut out the young larva; but I do not know how long a time the larva needs to come to its growth, or whether it undergoes its

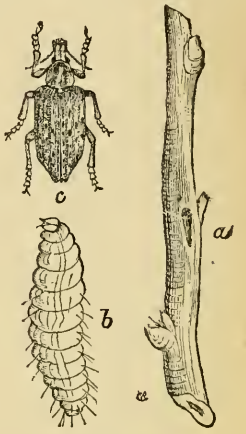


FIG. 16.
NEW YORK WEEVIL.

transformations within the branch, or leaves it for this purpose to enter the ground; though the former hypothesis is the more likely.

"This insect, in the beetle state, is more active at night than during the day, and is often jarred down upon the sheet or curculio catcher, for it falls about as readily as the plum curculio."

Lady Birds.

Coccinella.

Among thousands of insect enemies there are a few insect friends which aid very much in keeping the foes in check. Their whole mission seems to be to prey on the destroyers and prevent such an increase in their numbers as would prove fatal to plant life. Each injurious insect has its parasite foe, and these generally develop so rapidly in numbers, with the increase of the insect upon which they prey, as to counterbalance, and in some instances almost to annihilate them. Thus they render an aid that we can illy dispense with; and one of the greatest objections to the use of poisons in the destruction of insects is, that it proves fatal alike to friend and foe. The lady bird is justly regarded as one of the most useful of our friends. They are very numerous, and are to be found everywhere. It is estimated that there are over one thousand species, often differing but slightly in size, marking, color and form. The charac-

Fig 17. Nine-Spotted Lady Bird.

Fig. 18. Larva of the Nine-Spotted Lady Bird.

Fig. 19. Pink Lady Bird. *Hippodamia maculata.*

teristic form, in the beetle state, is hemispherical. Their color is generally yellow or red, with black spots, or black with white, red or yellow spots, but there are some species without spots; one of the most common of this class is what is called the trim lady bird, whose wing cases are of a uniform red color. The nine-spotted lady bird is, perhaps, the most common, Fig. 17; its wing covers are of brick color, with nine black spots. The *maculata*, Fig. 19, is also often seen, in which the color is pink, with large black

spots. The thirteen-spotted lady bird, Fig. 20, is much larger, and has thirteen black spots on a brick-red ground. The convergent

FIG. 20.
THIRTEEN-SPOTTED LADY BIRD.

FIG. 21.
CONVERGENT LADY BIRD.
CHRYSALIS AND LARVA.

lady bird, Fig. 21, is of a deep orange color, with black and white markings. There is a much larger species, the fifteen-spotted, which presents many shades of color, varying from a light gray to a deep brown.

FIG. 22. TWICE-WOUNDED LADY BIRD.

The twice-wounded lady bird, *Chilocerus bivulnerus*, is of a deep, shining, black color, with a blood red spot on each wing cover, and is about the size and shape of a smooth split pea. Its natural size is indicated by the hair lines in Fig. 22. The larva is a dark gray, prickly slug, repulsive in its appearance, but extremely active and voracious in its habits. It may often be found in the pupa state on the trunks of the trees infested with lice.

In the beetle or perfect state, this insect is familiar to most of our farmers, but it is to be feared that there are very many who are not acquainted with its mission, and but very few who fully realize the benefits derived from it. On the other hand, there are but very few who are acquainted with it in the larva state. Instances are not rare where farmers, and even some who call themselves horticulturists, finding a long, dark colored, spotted grub on their trees or plants, think it is a new foe, and commence with energy the work of destruction, little knowing that every life he takes is that of a friend, and gives immunity to hundreds of his enemies. In the larva state all the species have a marked resemblance, being of an elongated, oval form, quite pointed behind, of a dull color, with blue, yellow or black markings, and the soft, slimy looking body covered with pointed tubercles, and six legs

near the fore part of the body. No one unacquainted with its history would associate it with the trim and beautiful lady bird. When the larvæ have reached their full development they attach themselves firmly, by the tail, to the edge of a leaf near the place where their life has been spent in devouring insect life, and pass into the pupa state, and in a short time emerge in the beetle form. The latter hibernates, comes out early in the spring, lives upon the eggs and larvæ of other insects, and lays its eggs in clusters on the leaves and branches of plants and trees which are infested with plant lice, so that on hatching out the young grubs will find their prey within their reach. In both stages of its existence it is a voracious feeder, and each individual life is maintained at the expense of hundreds of others. In Europe, where their value is best known, they have a market price, and are often bought to colonize gardens and fields infested with destructive insects, to aid in their extermination. By all means, spare their lives, favor their propagation, and aid them in their work.

The Codling Moth.

From a Lecture before the Massachusetts Board of Agriculture: By Dr. Jabez Fisher.

This is one of the most important insects that we have to deal with, and one of the greatest curses — scarcely mitigated at all as the curculio is — that the fruit grower has to contend with. In the odd year our fruit is nearly all affected by the codling moth. In a year like this we are under more favorable circumstances, because last year we only grew a small crop of fruit, and, of course, we raised a small crop of codling moths. This year we obtained an enormous crop of fruit, and we got ahead of them. There was not codling moths enough to go round; hence, the large amount of smooth, clean apples, that we have raised. Many people have told me that they do not see one codling moth; that is, there were so many perfect apples, the beauty of which took up so much of their attention, that they did not realize there was anything else. But the codling moth has appeared this year, and you will find that he has had his share of the apples. At least one apiece. It is very seldom, indeed, that this insect will lay two eggs in one apple, almost never, if there are apples enough to go around; but where there are not, I have known six eggs to be be laid in one apple. The codling moth is a very obscure insect. It is a thing that you

scarcely ever see. Many people have never seen one. They have no idea what the moth is, and one reason is, that it is very small. Another is, that it is a night flyer; and another is, its habit of flitting about in such a way that you can scarcely keep your eyes upon it. But if you store apples in a cellar, and keep them late in the spring, you will find plenty of the moths on your cellar windows, that you can study at your leisure. I must say, that, with all my experience, I have never seen one out of doors in my life.

One great difficulty in contending with the codling moth is, that, like the potatoe beetle, it has more than one generation in one year; that is, it has two or three successive broods. The first brood of codling moth worms come to maturity and lay another set of eggs; and I think that the second brood also, in some cases, may

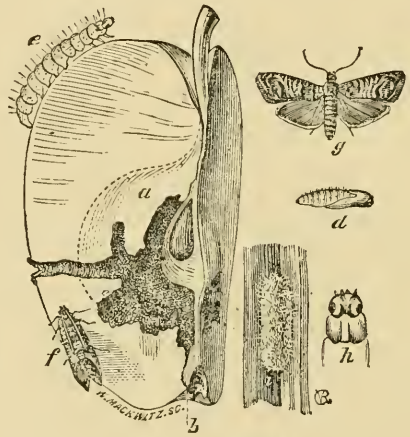


FIG. 23. CODLING MOTH.

lay eggs that come to perfection the same year. I am certain that there are two broods. The first one appears pretty early. I do not know exactly the date at which we find the first larvæ, but I think it is about the first of July. The insect lays an egg in the calyx of the apple or pear; the egg hatches, and the worm crawls out a little sideways, living upon the surface of the apple until it gets to a certain stage of development, and then it goes toward the center, for the core; then it bores up the core toward the stem; and the hope of the insect is, apparently, that, in doing all that, it will cause the apple to drop. The habit of the larva is this: When it comes to maturity in the apple, it has three courses open

to it. If the apple remains on the tree, the worm comes out of a hole in the side, and takes one of two courses: it either spins a web down to the ground, which is not very common, but it can be induced to do so by a shaking of the tree, either by the wind or otherwise (any artificial disturbance will cause it to spin a web, and it will let itself down to the ground); or, under other circumstances, it crawls out of the apple down the limb of the tree, and down the trunk, to where the bark is loose, and finds a place there to spin its cocoon. It takes a very little space; a sixteenth of an inch is an abundance for him, because he can gnaw as much as he wants, to enlarge it. If he falls to the ground by means of his web, he evidently has the faculty of seeing, because he heads directly toward the trunk, crawls up, and finds what the other has found in coming down the tree, and spins his cocoon there. Then a third way is that the fruit, by means of his boring, has became so far weakened, that it drops from the tree. In that case, the worm goes on feeding until it comes to maturity on the ground, if not already grown, and then comes out of the apple, and takes the same course that the other one did that had spun down, crawls toward the trunk of the tree, goes up, and finds a place in which to spin his cocoon.

Now the spot to trap him, apparently and really, is just at the trunk of the tree. My practice has been this the past year, and I have followed it faithfully, and can give you entire results: In the first place, I scrape the trunk to make it smooth, so that he will not have any chance to spin his cocoon outside of my arrangement; then I have a piece of wrapping paper, which I fold up, and tie around the tree. I want to make as many traps for him as I can, and I fold the paper from two to three inches wide, fan fashion, and then with a string it is tied about the tree, passing around the middle of the paper. It is tied loosely, with a bow knot, so that it is easily untied. The result is, that the worm will either crawl in among the folds of the paper, or, as he seems to prefer, the space between the inside of the paper and the bark of the tree. Here is a paper that has been used the whole season. It is ordinary thin wrapping paper, and it would almost do for another year. I put one of these papers around the trunk of each tree that had been scraped smooth, as I said; and then I went around every Monday morning, took off the papers, and counted the moths that were in

them. When I saw one, having a knife with me, I wiped it across him and killed him. They must be killed individually; you cannot get them collectively. Then the paper was immediately re-wrapped around each tree. I applied the papers thus to fifty-seven trees in my orchard. The first larvæ were found in the papers on the 22d of July. They were probably there two or three days before, but there was not one there on the 15th. I was told to apply the papers the middle of June. This was the result. I put them around at that date; but the first codling moth was not found until July 22d, and could not have been there more than six days, of course. I found at that time 76 worms or larvæ; a week later I found 59; a week later, 134; and then, 135; then, 344; then, 147; then, 205; 267, 222; and 274 on the 23d of September. Then I did not go around until the 28th of October, at which time I supposed the season was entirely through, and I found 289, making a total of 2,152 codling moth larvæ from fifty-seven trees. I trapped so many in that simple way. Part of my trees are in grass land, and part in cultivated land; and I got a great many more in the cultivated ground, not, perhaps, because there were more there, but because the grass was an obstacle to them in finding the tree. I do not know, but I suspect that, when they are in the grass, it is very difficult for them to find a tree, and they spin their cocoons in the grass. I have no doubt of it, and therefore, for this reason, the proper place to grow trees of that kind is not where you grow grass, as well as for other reasons also.

Beside this, I have been for some years in the habit of thinning all my pears; and this year, for the first time in my life, I have thinned my apples, only I did not thin them half enough; but I did take off all the imperfect ones. I thinned out upon the same principle that I do pears, and you will excuse me if I say a word about that. After the curculio has done its work (which is for me a desirable one), I thin out a good many of the fruits when they are about the size, or before they get to the size of an English walnut. I have made a business of thinning out all my pears for some years, and after a good deal of experience, I have worked up an implement for the purpose. It is a little forked piece of steel, bent in a peculiar way. That instrument, put on to the end of a long pole, like a rake handle, is the prettiest thing that can be imagined, for thinning pears especially. The only difficulty with

apples is, that many stems of apples are so short, that it is not easy to get hold of them; but it will take a pear every time. It is carried up as close to the end of the stem as possible, given a slight turn, which breaks it off at that point, and the pear drops; or, if you choose, the pear can, with a little care, be conveyed down into your hand. The inside edges of the fork should be square, and it should be tempered rather soft. My instructions to the pear thinners are these: There are four classes of pears to be removed. In the first place, where there are two or more growing in a cluster, they are to take out all but one; no matter how handsome the others may be, or how tempting it may be to let them remain, everything is thinned out to one pear in a place. Second, every pear that is deformed, that is not going to be a perfect fruit when grown, is taken out. It is nonsense to keep your tree at work, undertaking to grow imperfect fruit, that will never be worth anything. Third, every pear that shows evidence of the codling moth is to be removed; next, all the small, weak pears; every pear that cannot keep up with its neighbors, as Kearney says, "must go."

That is severe thinning, but that is sometimes only the beginning. Having thinned out everything that is imperfect, everything that is in the way, then the tree is to be looked at as a whole, to judge if it is bearing more than it should. If it is, then the fruit is to be thinned out still further. That is the most difficult thing in the whole operation to do, to thin out pears that are perfect, just as good as their neighbors; but they must come out, because the tree has too many. There is no rule about this; it is a matter of education. A man must judge from his experience how much each individual tree can carry. Mr. J. J. Thomas has formulated a rule, which it is perfectly safe to follow, the substance of which is this: That no ordinary, medium sized pear, should grow within six inches of another. That is a safe rule; you will not lose any money if you follow it. In many cases it ought to be ten inches instead of six.

Now what I was coming at was this: Wherever the codling moth larva has been at work, those pears or apples, if left undisturbed, sooner or later drop upon the ground. They are worthless, but every one that has a worm in it should be at once secured. I am, therefore, in the habit of going through the orchard about twice a week, and picking off all the wormy fruits before they drop;

these are kept in a basket as gathered, and if worth feeding to hogs or other animals, I get rid of them in that way. If they are not, I have a very convenient place where I can dump them into the river, and trust, for the benefit of the people who live below, the worms are prevented from transforming. That is the quickest way with me. I suppose that in that way there were apples enough picked off this same orchard to destroy a number of codling moths equal to those I caught in traps upon the trees, making about four thousand worms that were secured. Well, my crop was about one hundred and seventy-five barrels of good apples, generally free from the codling moth. We found but very few when we came to pick the crop.

Now, let me ask, what will be the result to me next year? I will suppose that two thousand of the four thousand were females, and that they lay eggs to the amount of thirty each; I believe that is the ordinary estimate. I suppose that two thousand of these lay thirty eggs each that come to maturity, and we have sixty thousand codling moths that I have headed off. Now, supposing that each one of these codling moths should have gone on to maturity, and should take an apple each next year, there would be a hundred and twenty barrels of apples spoiled. If my orchard should happen to bear a hundred and twenty barrels of apples next year, I have killed codling moths enough to save the whole crop. Now is it worth doing? Will it pay? That everybody must estimate for himself. I think it does pay; I think it pays to thin apples; and it pays especially to kill all the codling moths that you can find under any circumstances. The total cost has not been over four hours' labor a week for thirteen weeks. In addition to the means here indicated, I would further suggest, that an important means of preventing the increase of the codling moths would be to cut down all the valueless cider apple trees in the neighborhood, which now serve only as nurseries for their development.

NORTHERN SEEDLING APPLES.

By J. C. PLUMB.

The great demand for a more hardy race of apples for the north is a great stimulus to those interested to bring to the front everything that promises to add to our list of hardy varieties. Each locality has its candidates for popular favor, and hundreds of new seedlings are undergoing the test of climate and cultivation in different localities, very few of which, even the most promising, can attain and hold a place in the recommended list of this society.

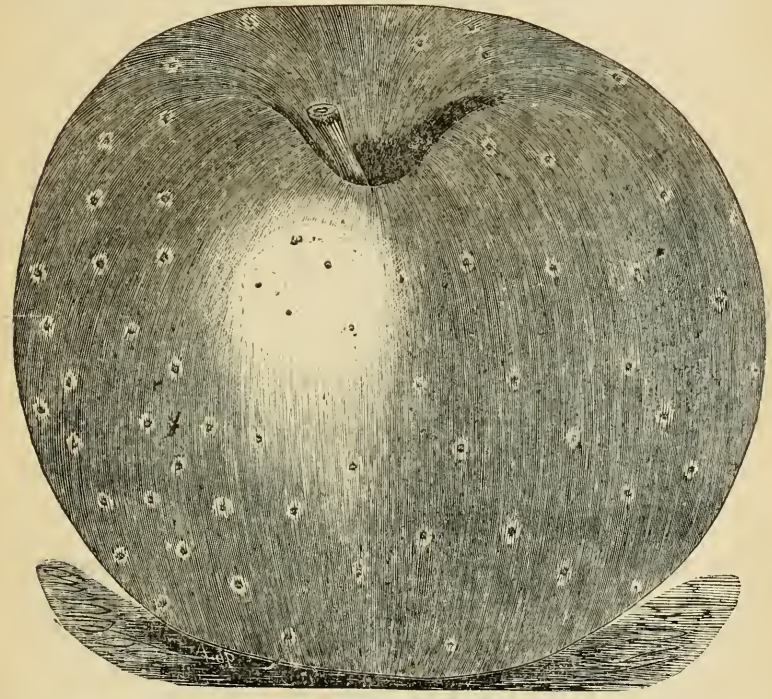


Fig. 24. Wolf River.

It is a wise provision of our premium list, which requires that any new variety, before it can receive the highest award and commendation of the society, shall have been "exhibited three years, and cions furnished for testing in different localities, and that *it must have more desirable qualities than any now on the recommended list.*" Yet it is the work of this society to encourage the production of new and promising varieties, by describing and illustrating them from year to year, in the volume of its reports.

Among the many promising new apples, none shown at our annual exhibitions have attracted more attention than the "Waupaca County Seedlings." All these, so far, are accidental seedlings, and grown in various localities and conditions, favorable and unfavorable, but for size, beauty and real worth of fruit and tree, are some of them worthy of special mention in this volume.

Conspicuous among these is the Wolf River variety, originated about fifteen years ago. The original tree now stands near the east

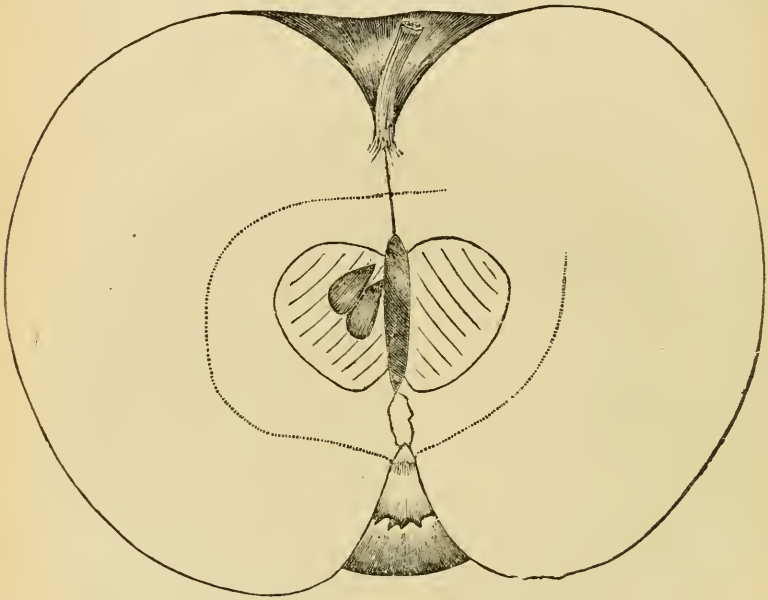


FIG. 25. OUTLINE OF WOLF RIVER.

bank of Wolf river, in the northwest corner of Winnebago county, some twenty feet above low water mark; soil, red sandy clay, quite impervious to water, and tends to produce a late, unripened growth; originally heavy timbered with oak, elm and ash. It was once a part of a large and promising orchard of seedlings and grafted fruit, of which little remains but this tree and two Duchess in fair condition, while other Duchess near by show signs of early decay. The location is evidently a very trying one for the apple tree. The Wolf River tree is exceedingly vigorous, hardy and productive, even there. It is of a strong spreading habit, and I should say a seedling of the Alexander, which it resembles in general outline and quality of fruit. Fruit large, round, flattened,

smooth, mostly red, in two shades, and green mixed; dots large; cavity regular, wide, smooth; stem medium; calyx large, in shallow basin; core and seeds medium; flesh white, rather coarse, firm, juicy, mild sub-tart; second quality; October to December.

Martha, of Wrightman. Medium to large, very round (would be called oblong), very smooth, covered with rich red, often very dark; stem and cavity small; calyx closed in narrow, deep basin; flesh white, fine grained, tender, sub acid, very good; October to December. This, with the three following named, originated with Mr. E. Wrightman, of Weyauwega, Waupaca county, and were planted out in orchard in 1867. Soil, white oak clay, well filled

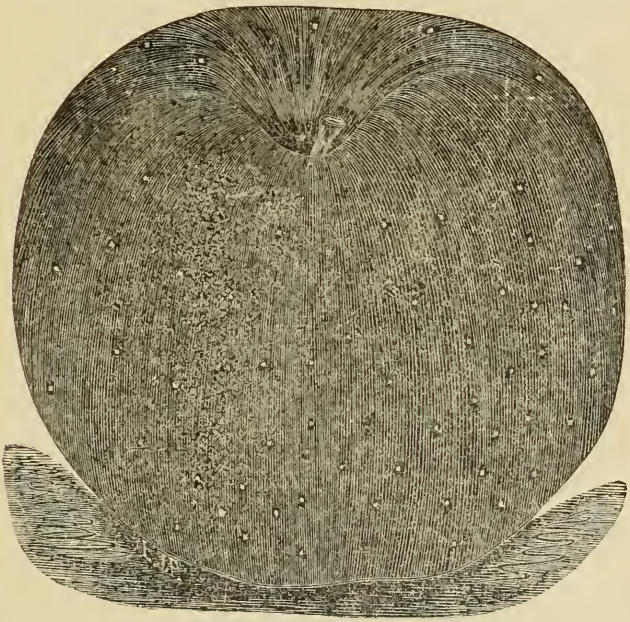


Fig. 26. Martha.

with boulders from the drift, and streaked with sand and gravel; located upon the south slope of a high hill, with timber on the west. It is a trying place for fruit trees for that latitude (44° 15′). These varieties are doing remarkably well; having little culture, they are not pushed to excess, and have borne good crops for several years.

Weyauwega — Large conical, mostly red; flesh white, fine grained, sub tart, good; January to April.

FLORA — Medium to small, round, red; flesh white, sub-acid, good; December to April.

WRIGHTMAN (Russett) — Resembles in the outline Westfield Seek-no-Further, and nearly equal to that variety in all essential quality of fruit; keeping well through winter.

BALCH — Originated with A. V. Balch, Esq., of Weyauwega. It resembles the Black Detroit in general outline and color, but the tree is much superior; very promising.

RICH'S GREENING — Originated with Mr. A. E. Rich, of the same locality as the above. Good size, conical, green, rather coarse, and not rich, but fair flavor and good keeper.

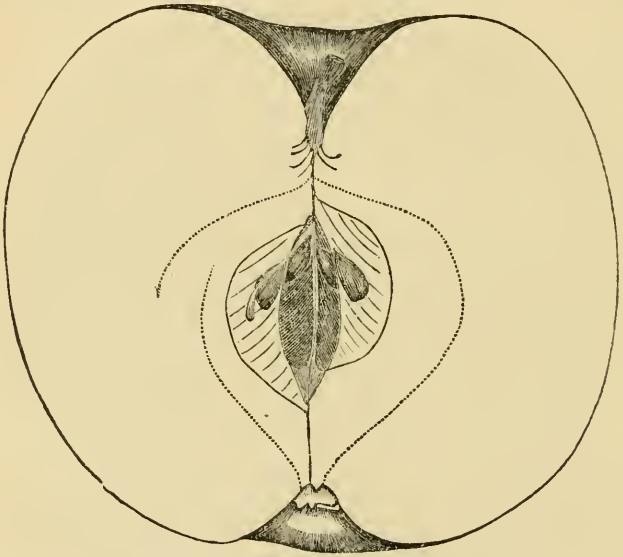


FIG. 27. OUTLINE OF THE MARTHA.

The above named new apples have been exhibited at our state and local exhibitions several times, and have attracted much attention from their size, beauty and quality. The Waupaca County Horticultural Society have, through their committees, made careful examination of the trees, which they report unusually successful, and after a personal visitation to most of them several times, I cannot but think them of value for similar locations. In this connection, I will say that Mr. Wm. Springer, of Fremont, Waupaca county, has been very enthusiastic in looking up these new varieties, and not less liberal in spreading far and wide the cions of them for trial in other localities.

REPORTS OF LOCAL SOCIETIES.

The space allowed us in former volumes of the transactions of the society was so limited as to make it necessary to give the reports of local societies in a very condensed form, but on securing the enlargement of the volume, being convinced that much might be done to promote the general interest in horticulture and to increase the efficiency of local societies by having much fuller reports from them, the secretary wrote to the officers of these societies, requesting an abstract of their proceedings, including an account of their work during the year, the leading points brought out in their discussions, and some of the papers presented at their meetings, for publication in this volume, but the minutes kept were found to be so very incomplete that it was impracticable to carry out the plan the present season; could it be carried out in future reports, much good would result, in bringing the state and local societies in closer relations and greater sympathy with each other, and thus giving an incentive to increased activity to all.

The Brown County Society being one of the most prosperous and energetic societies in the state, and a general interest being felt in its prosperity, I wrote to its secretary, W. Reynolds, of Green Bay, to have him prepare a report of one of their meetings, to be given in this volume, from which an idea might be obtained of the manner in which these meetings are conducted, and by what method the society has been brought to its present prosperous condition. This report is given in connection with the general report of that society.

BROWN COUNTY AGRICULTURAL AND HORTICULTURAL SOCIETY.

Green Bay, *April* 26, 1879.

This society is in a very flourishing condition. Monthly meetings have been held during the past year, which have been well attended and full of interest. During the summer season, these

meetings were held in different parts of the county on the premises of the farmers who were willing to furnish out-door accommodations for a basket or pic-nic dinner. This was an interesting and attractive feature, and it induced many farmers, accompanied by their families, to attend and take part in the meetings, and the regular business of the society was transacted, and its objects carried on with greater zeal, energy and efficiency than ever before.

The officers elected for 1879 are:

President — J. M. Smith, Green Bay.

Secretary — Werden Reynolds, Green Bay.

The regular monthly meeting of the society was held this day at the residence of Vice President Wm. Rowbotham, in the town of Preble. There were present about twenty-five members of the society, most of them accompanied by their wives; also several visitors, both ladies and gentlemen, numbering in all about sixty persons.

The meeting was called to order by the president, and the minutes of the preceding meeting read and approved.

The president announced that he had written to the department at Washington, for a few copies of the Report of the Commissioner of Agriculture, for the year 1877, and hoped to succeed in obtaining them. He also stated that he had made arrangements with Mr. Hurlbut, by which the members of the society could obtain plaster Paris at $1.10 per barrel, if a car-load was taken.

He gave notice that the list of premiums adopted at the last meeting for the session of the State Horticultural Society, to be held in this city in June next, had been printed, and copies were in the hands of the secretary for distribution. He desired that the members would give them general circulation in the county.

The following resolution, submitted by Mr. Bennett, was considered and adopted, namely:

Resolved, That all persons not members of this or of any other horticultural society in the state, who shall desire to compete for premiums at the exhibition of fruits and flowers by the society, in June next, shall be required to pay an entrance fee of fifty cents.

Reception of new members being in order, Messrs. Alfred Thomas, principal of the high school in Green Bay, John Hogan, farmer, of the town of Preble, and John Campbell, farmer, of the town of Scott, were duly proposed and admitted as active members; also

Mrs. Julia E. Lawrence, wife of C. J. Lawrence, of the town of Howard, as honorary member.

The preliminary business being transacted, the society proceeded to the principal work of the day, as arranged at the last meeting, namely, the reading of volunteer papers relating to the general subject of horticulture, the particular topic of each paper to be chosen by the writer.

REPORT OF A SUMMER MEETING OF BROWN COUNTY HORTICULTURAL SOCIETY.

The following were presented and read, each being followed by familiar discussions of the topics therein considered, to wit:

HORTICULTURAL vs. FARMING.

THOMAS BENNETT.

It is impossible to separate the one from the other any more than it is to say when a colt becomes a horse; the one grows into the other; but just where the one ceases, and the other begins, is uncertain. Perhaps the Holy Writ may aid us some in the solution. God placed our first parents in the Garden of Eden, where was fruit beautiful to look upon and tempting to the sense; also, there was the tree of Knowledge. For his disobedience he was driven out, to subdue the earth, where the thorn and the thistle, together with all other noxious weeds, were to be conquered by man in his struggle for food to sustain life. Although the Garden was lost to him, the tree of Knowledge was left him. But as we glance back over the many centuries that man has labored, we marvel at the little progress he has made. When we consider the field is the world and all its life, both animal and vegetable, we are admonished that our forefathers, as well as ourselves, have gathered but little fruit from the tree of Knowledge. There was another tree in the Garden of Eden, the tree of Life; and they seem to be cultivated together. For where nations have accepted God's word (which to fallen man is the way to the tree of Life), the tree of Knowledge has yielded the most and best fruit. Where Christian civilization has been the most thoroughly developed, there has knowledge become the most universal. The earliest Horticultural Society that

we have any account of is of recent date, within the present century. Mr. Knight and others formed a society and obtained a charter in 1808 in England, called the London Horticultural Society. From that date other societies were rapidly organized over nearly all Europe, and also in our country. At the present time they have multiplied to thousands; and wherever enlighted man tills the soil, the tree of Knowledge has been the most fruitful. From our standpoint it appears that man has gathered more fruit from the tree of Knowledge in the present century than in any previous one within the world's history.

How are we to know the farmer who has advanced into the science of horticulture? Perhaps you will say, by his intelligence; by his improved taste; by his beautifying his home. Let us take a mental look among the farmers of our acquaintance, and compare those who cultivate a taste for horticulture with those who neglect it. (I had almost said, look upon it with contempt.) The home of the first is improved from year to year; the surroundings brought into harmony; the lawn has been graded; clumps of trees and shrubbery have been added; large and small fruit has been largely increased; the garden is filled with the choicest vegetables; the whole surroundings show taste, neatness and thrift. Now we will look into the house. There is the handiwork of the intelligent and thrifty wife and mother; the ingenious little ornaments and comforts that none but a cultivated mind could devise. The little bric a brac in every room show industry and taste. The library is arranged in neat order, the table in the sitting room has a few choice books, handy to read. There is file of agricultural papers for reference. We see her admiration of horticulture in her window garden, filled with a choice collection of flowers and vines. In a word, as our eyes rest upon the arrangements and surroundings of such a home, an inexpressible peace comes over us. We feel and know that cultivation and refinement are joined together, and if peace and contentment are to be found in this struggling life, it is where man and wife have united to make to themselves another Eden. Where all these changes are taking place, we are hopeful that man is returning to that garden, from which old Father Adam and Mother Eve were driven.

Methinks, some one says, I have not got the cultivation, taste, or money, to waste in ornamenting and beautifying my home. We

will admit that you have not the taste, because you have never tried to gain it. How did you learn to plow and sow and reap and mow. Was it by practice? At first you were very awkward, but continued effort made you a workman.

So with your taste. Commence and do the best you can. Set a few shade trees, also a few fruit trees. Make a small garden; attend to what you have done; and after looking over your labors with a critic's eye, to perceive what ought to be done to give harmony to the surroundings of your home, when you have leisure time carry out your plans. As to the money, it does not need much. Neither would it be wise for you to invest much in your early beginning. First, cultivate the ideal; learn to admire some of the beauties that God has so bountifully surrounded us with. The beautiful forest with its soothing shade, and its ever changing foliage; the flowers and grasses that clothe the earth in the most lovely colors; the hill and dale; the gurgling rill, and the mighty river that flows silently on to the boundless sea, all incite us to cultivate those higher faculties placed in our natures; and while reverencing Him who has given to man this great heritage, should not order and the love of the beautiful, have an active development in our daily life? If our suggestions are in harmony with the higher qualities of your nature, look about among your neighbors, and get some lilacs and hardy roses, and what you can pick up without money. Go to the forest and get some good trees and set along the road side, and such other places as will give a pleasing effect; make a fence around your garden; set some small fruit, which can also mostly be obtained in the neighborhood, and as you advance, your desires for something better will find a way for their gratification. Take care of what you have already done, and you will find it easy to get other choice shrubbery, fruits and vegetables. As your education develops in horticulture, so will a refining influence grow upon you, until your whole soul will drink in the wonderful beauties of nature, and contentment and the pursuit of happiness will pervade the whole family.

The following poem was then read:

WILD FLOWERS.

BY WERDEN REYNOLDS.

The wild flowers, the wild flowers, uncultured and true
From nature's own garden — of nature's own hue;
No hot bed distortions, nor monstrous forms — no; —
'Tis thus that I love flowers, as God makes them grow.

And thus do I love, too, affections of heart,
Up-welling, spontaneous, untrammeled by art: —
I love them all true, unaffected, sincere,
Like the beautiful Wild Flowers that God gives us here.

Then gather life's wild flowers from young and from old;
Those grown in true hearts — the pearls and the gold; —
Bind up a sweet nosegay to cheer life's lone hours;
Mementoes of dear ones in language of flowers.

The hawthorne of hope, the constant blue bell,
The pure drooping lily, that blooms in the dell.
White violet and myrtle, so modest and mild,
And woodbine fraternal, all native and wild.

The Indian jasmine, attachment to you;
The sweetbrier, simplicity; bittersweet, true;
The orange flower, chaste of so delicate tint,
And emblems of virtue, the snow ball and mint.

The humble-born daisy, to innocence dear,
The osier of frankness, and fern, the sincere: —
'Tis such flowers — the wild ones — most dearly I prize,
Earth's loveliest symbols of joys in the skies.

Yes, gather them all from the loved of my youth,
The wild flowers of sympathy, friendship and truth: —
And wreathe their sweet symbols; with ivy entwine
A garland of fragrance for memory's shrine.

It is not for the secretary to speak of this piece, further than say that hearty applause followed the reading.

At the request of the author, the secretary read the following paper:

THE GOOD AND THE POOR FARMER.

Dr. ISRAEL GREEN, 87 years of age.

Mr. President: In passing through the country some time ago, I was lead to contrast the difference between the thorough farmer and the careless, slipshod one, and to note the result at the close of a long life.

Let us look at two young men commencing life, with the intention of making farming their business of life. They are both placed on equally good farms; they both have good health and equal advantages for making a useful and successful career, and at the end of life, to lay up a competence for their families, if they both pursue the same course of cultivation. But, unfortunately, one of them is careless and slovenly in his management; he takes no agricultural papers; he takes no pains to inform himself of the best modes of improving his soil, but just goes on, from year to year, plowing and sowing and reaping his scanty crops. He sows no grass seed or plaster; his fields are barren of pasture; he keeps but little stock, and what he does keep is of the lean kind; he saves but little manure, for what is made is scattered over a large yard; trodden in the ground by the cattle; exposed to the hot sun, which evaporates the ammonia and other volatile gases, and the rains wash out the nitre and soda and other soluble substances that supply food for plants, leaving it almost worthless as fertilizing material, and, of course, his crops are poor, and grow poorer every year as his land becomes exhausted. He works hard, for he has to till more land to support his family; he lives poorly, without many of the comforts, and none of the luxuries, of life. His children are poorly clothed, poorly educated and unrefined. His house is poorly furnished. You pass his place and see nothing to make a home what it ought to be. You will see no shade trees, shrubbery or flowers to ornament the place, and but little fruit to promote the health and comfort of his family. He has but few farming implements, and those of a primitive kind; and you will see the whole surroundings of his place have a careless and slipshod appearance. And at the close of his life he leaves nothing behind for his family but a

poor, impoverished and worn out farm, worth less than when he went on it; and finally, he will pass away without being missed or regretted as a benefactor of his race.

Now let us turn from this picture to the other young man, who commences at the same time and under the same circumstances. He starts out in life with a laudable ambition to improve his condition, both morally, intellectually and financially; he will study the nature of his soil, and, with the aid of agricultural works, he will endeavor to ascertain what crops are adapted to it, and what he will want to apply to give him the greatest possible yield from the smallest plat of ground, so that when he comes to harvest it, he will have a crop that will yield him a surplus of profit above all expense of cultivating, so that at the end of the year he may have a satisfactory bank account in his favor, that he may be enabled to supply himself with the most improved farming machinery to lighten his labor, and cultivate to the best advantage. He is careful to increase his compost heaps with all the means within his reach, and protect it from the weather, so all the elements of plant food may be retained for the growth of crops and enrichment of his land. He seeds all his land to grass; sows plaster. His fields are covered with a rich verdure of grass; he keeps a large stock of the best breeds of cattle, that are always in fine condition and will command the best price in market; he takes a number of papers and is always posted on the market, and knows when to take advantage of it so as to get the best prices for his products; he furnishes himself with all labor-saving machinery, so that he does not have to work as hard as some of his neighbors; he has more time to read and cultivate his intellect; he lives better, and has more of the comforts and luxuries of life.

His house is better furnished, his children better educated, better dressed and more intelligent. As you pass his place, you will see everything about it in a neat, snug and thrifty condition; you will see the farm and garden well stocked with fruit and vegetables; the yard adorned with shade trees, shrubs and flowers; his porch covered with vines, and the surroundings wearing a refined, cheerful aspect, that makes a paradise of beauty; that attracts the family as a loving household; that is beautiful not only to them but to their friends. You enter the drawing room; you will see the book shelves well stocked with useful and entertaining books; the center

table covered with magazines, music and periodicals; vases of flowers on the mantle; the ladies cultivated and intelligent, able to converse on almost any subject, and all has an air of refined culture that throws a charm around the whole house, that unites and attracts the family to each other, and to their home, so that it is hard to sever the ties of affection that bind them together. You seldom see children thus brought up, wander off into loose and dissolute ways; their home attractions are too strong a tie to be severed. When at last, after a long and useful life, he passes away, he leaves a void that is widely felt by a large circle of sympathizing friends. It is the loss of a good and useful citizen, who has been a benefactor to the age in which he lived; and he leaves behind an influence that will be useful for generations to come.

The reading of this paper being concluded, the excellent hostess, Mrs. Rowbotham, made the welcome announcement that dinner was ready, whereupon the intellectual part of the festival was at once suspended, and the members and visitors promptly repaired to the dining room, where the honors challenged by the groaning tables were obsequiously awarded with abundant *gust*, but not a wrinkle of *dis*gust.

Dinner duties deftly done, the society was again called to order and proceeded with its "feast of reason and flow of soul," and the following paper was read by our president:

WHAT KIND OF A GARDEN SHOULD THE FARMER HAVE?

By J. M. SMITH.

Ladies and Gentlemen: In considering this question, we will suppose that the farmer's family numbers from six to ten persons; that he has a farm of from 80 to 160 acres, and can afford sufficient space for a good sized garden, without in any manner interfering with his general crops. Suppose we select an acre of good land, or such land as can be made good by drainage, manure, and good cultivation. It should be near the house, and, if it can be had, I prefer a sandy loam, as it will be easier to work, and the crops will be a little earlier than if planted upon either a heavy loam or a dry

soil. Still, if the former is not at hand, the latter will answer the purpose.

As it is now spring and we are naturally looking for something fresh and nice, what shall it be? Asparagus is not only the earliest of our out-of-door crops, but it is one of the very best of them. And how many of my farmer friends, either here or elsewhere, have nicely prepared beds of this delicate and delicious vegetable? I am often surprised to find so few beds of it even among our best farmers; but am well satisfied that one of the principal reasons for there not being more of them, is the ridiculous and extravagant directions that are yearly given in our papers and elsewhere for setting a bed, making it so tedious and expensive, that many are deterred from ever making an attempt at getting one. I have between one and two acres of it that annually yield very large crops, and I will tell you how I set it. I select a piece of good land and manure it very heavily, plowing it under. Then put on more manure on the top of the ground, and harrow it in. This last should be fine manure.

Then take a shovel plow, and make furrows three feet apart. These furrows are for the plants, and should be so deep that the crown or head of the plant from which the stalk starts should not be less than four inches nor more than six inches below the surface of the soil after the bed is finished. Now, we are ready for the plants. Conover's Collossal is probably the best. Get good strong roots, either one or two years old, and set them in the new made furrows from fifteen to eighteen inches apart in the row, spreading the roots out in every direction about the crown of the plant, and thus getting them as near their natural position as possible. It is well now to put still more manure in the furrows on the plants, and then fill up the furrows, making the bed level, and the asparagus bed is made. If it is properly cared for, it will last your life time. No trenches three feet deep with stones and planks in the bottom, and other things equally useless on the top. After the bed has been made as directed, it will need no further care the first season except sufficient cultivation to keep the weeds and grass from interfering with its growth. The following spring, and in fact every spring thereafter, the dry tops should be cut off close to the ground and burnt as soon as the bed is fit to work, and a coat of manure put on the bed and dug under. For this purpose we use a six-

tined manure fork, being careful not to dig so deep as to interfere with the roots of the plants which run in every possible direction, and fill the earth with an almost solid and compact mass.

If the bed is twelve feet wide and fifty feet long, it will, if properly cared for, give an abundant supply for a large family from early spring until June, when we may have plenty of green peas to take its place, and give it time to recover its vigor and strength, and be ready to give us another supply the following spring. It is a gross feeder, and requires very rich soil to make it do its best.

Let us turn to other crops. Peas are about the first seeds to be out in the ground, and are a favorite with almost every one, and with a fair chance, almost a sure crop. Any land that will produce a large yield of corn is fit for peas. Put the soil in good condition, and with the shovel-plow make furrows four feet apart. Regulate your hand seed-sower so that it will drop from one to two seeds to the inch. Sow a double row in each furrow. Your furrow will be, if four inches deep, perhaps eight inches wide in the bottom. This will enable you to pass twice through it and sow them about seven or eight inches apart, making what the books call a "double row," and leaving a space of a little over three feet between the rows, through which you can readily pass with your horse and cultivator as often as is necessary. After your peas are sown, fill up the furrows and make the ground level. By planting them this depth, they will endure the hot sun and drought better, and will continue longer in bearing than if planted only an inch deep. For families that are very fond of them it is well to make a second sowing, which will give an abundant supply until the early potatoes are ready for use.

Some of us are very apt to sneer at the idea of eating onions, and yet a nice bed of them is about an absolute necessity in every farmer's garden. A few sets, that is, the very small onions grown from the black seed of the previous year, put out as early as the land is fit to cultivate, will give you a supply of young onions very early. And to these a few top onion sets which come on a little later, and sow a bed of the black seed for your main crop. Onions of all kinds require a very rich soil to do well, and can hardly be got in the ground too soon after it is in a condition to work. A small bed of spinach should be sown. Or what would be better, sow it early in September of the fall previous, and when

cold weather comes on, cover it about one inch in depth, and then take the straw off as soon as anything can grow in the spring. For families who like a dish of greens in early spring, this is much better and easier to get than to hunt the fields over for dock, dandelion, etc. It makes a nice and pleasant dish, and may be had very easily and in any desired quantity.

Beds of beets, carrots and parsnips may be put in early, and if there should be some frost after they come through the ground, it will not injure them. Beets, carrots and rutabagas that are wanted for winter use, are better both for keeping and for the table if they are not sowed sooner than the 15th of June in our climate. Some radishes should be sown early, and on a sandy soil. This is one of the few, among our garden vegetables, that will do reasonably well on land that is not very rich. The yield from the first sowing is apt to be more or less infested with the white maggot. But do not be discouraged. The second sowing which should be, say, two weeks later, will have but few of them, and then if you will sow a little bed at intervals of ten days apart, you will soon be free from the little pests, and may have nice radishes until you are all tired of them. The best that I have ever raised or seen, were grown in almost pure plastering sand, with a little fine manure put on it. In hot weather we have repeatedly had radishes (when sowed in this manner) upon our table in three weeks from the time the seed was put in the ground.

For those who like oysters, a small bed of the vegetable oyster is a necessity. They should be sown early and cultivated the same as the parsnip. This about completes the list of what we term hardy seeds, or those that may be sowed while the ground is still cold and liable to be more or less frozen during the cool nights of April. Generally, about the first of May, or soon after, you will need a few nice cabbage plants for early cabbage; also some nice lettuce plants, to set out, and have them head up as soon as we have a few hot days. Here almost every farmer says, "I have no hot-bed and have not the time to make and care for one." Well, if the wife or some of the children will prepare a little rich earth in the fall by putting it into boxes, say five inches deep, and set them in the cellar or some other place where they can be had when wanted, and about the middle of March plant some cabbage, lettuce, and tomato seeds, keep them in a moderately warm room, and near a

window where they can get the sunshine, even so you may have some plants. Be sure and not leave them too thick,—twenty-five good plants in each box are much better than one hundred poor, crowded, puny things, that will require half the summer to get started, and the other half to get ready for use.

The latter part of April is generally as early as potatoes should be put in the ground, even for the early crop. Generally by the 10th or 15th of May it is safe to plant sweet corn; although if the weather should be wet and cold, as it sometimes is at that season, it is better to wait a few days longer rather than have the seed rotted in the ground, or so injured that it may never recover. I find that if we plant the Early Minnesota, the Crosby, and Stowell's Evergreen at the same time, they will follow each other and keep up a continuous supply, and then plant a little more of the Evergreen from the 1st to the 10th of June, and you will have a supply until frost comes.

Tomatoes, peppers and egg-plants should not be set out in the open ground until it is well warmed, and danger of even light frosts is past, unless you are prepared to protect them during the cool nights, and then they will sometimes become so chilled, even without frost, that all the first sets will fall from the vines. Melons are also very sensitive to cold. For some years past we have practiced a plan with vines, that I have never seen on any other ground, and I think is not common, although some others doubtless follow the same plan, or possibly something better. We make the melon hills, drop the seeds, and cover them. Then we take a box made of boards six inches wide, and six by eight inches square on the outside; put it down over the seeds, and with a broad hoe haul the earth up around the outside of the box, and press it down with the blade of the hoe until it is sufficiently firm to remain in its position after the box is taken out. We place the box with the long way to the north and south, and make the earth about one inch higher on the north end of it than it is on the south end. After taking out the box, a light of eight by ten glass is placed on the top of the earth, and we have a miniature cold frame, and a good one at that. The seeds will soon come up, and by the time it would be safe to plant them in the open ground, you may have nice plants all ready to commence making vines. When it has become thoroughly warm and settled summer, haul the earth away from the hills, and

lay your glass aside for another year. During some of the hot days it will be necessary to take off the glass, or the intense heat may destroy the plants entirely. We find this an excellent plan for all the vines from which we wish to get an early crop. One of the chief causes of failure among our farmers with their melon crop, is getting them too thick. The varieties of nutmeg melons should be not less than six feet apart each way; and then not more than three plants allowed to grow in the hill, and often two is better than three. Watermelons at this distance, not more than two, and if the land is in such order as it should be, one is still better. Cucumbers about the same as nutmeg melons.

Now, a few words about planting for late crops. Cabbage for winter use should not be set sooner than the middle of June, and I like July 1 still better. In fact, we set cabbage until the 15th of July with the expectation of getting a full crop. Cauliflower should be started with your first early cabbage, or else left and not set until the latest of the cabbage is set. When the plants come to their maturity in our hot, dry weather, there is not one chance in ten of their making a nice flower. Celery seeds should be sown in the early spring in a very carefully prepared place, and then the plants set where they are expected to grow not earlier than the middle of July. The finest crop I ever raised, and I think the finest I ever saw, was set on the 5th of August. It may be laid down as a general rule, that for winter vegetables, the later the seeds are planted, provided they have sufficient time to mature, the better will be the quality, and the better they will keep through the winter.

Suppose I give you a list of some varieties of plants, such as I have found to be best adapted to our soil and climate. The names of the different varieties are numbered by thousands, and yet the standards among them are really very few. Of peas, for the first early, the Dan O'Rourke or the early Philadelphia; for the main crop, Champion of England; lettuce, early Simpson; beets, early blood turnip; late, either the same, or the long blood beet; carrots, early short-horn; cabbage, first early, Jersey, Wakefield; main crop, Fotler's; radishes, Covent Garden and French Breakfast; I have been unable to distinguish the different varieties of parsnips, except upon the seedman's papers; tomatoes, first early, the early York; main crop, the Trophy; onions, sets for early, and yellow Danver's for main crop.

For the farmer it is better to plant in rows of some length, and for most articles, a sufficient distance apart to cultivate with a horse; and in all other cases, plant in such a manner that a good hand cultivator may be used without any difficulty. No farmer's garden is complete without its fruit department. The varieties of strawberries are numbered by hundreds, and more new ones constantly coming out; and yet we can almost say, and say it safely, that there is but one standard variety for the country generally. Set a bed of Wilson's, and with reasonably fair cultivation, you are almost as certain of a crop as you are that summer will follow winter and spring. There are other varieties that have done, and are still doing well, with some men, and in some places; but there is nothing yet tested that will compare with the Wilson for the amateur cultivator. With fair cultivation you may expect a yield of forty quarts per square rod. I have repeatedly had much more than that amount. If you wish to try other varieties and get some magnificent fruit, Seth Boyden's No. 30 will give it to you. Then there are the Duncan, the Red Jacket, Prouty's Seedling, and the Crescent Seedling, and hosts of others, from which to choose. Downer's Prolific is a splendid table berry, and bears passably well. Now, do not think me prejudiced against other varieties than the Wilson. Such is not the case. I have them, and have the plants to sell, and would gladly recommend them if I could honestly do so. Of raspberries, you need a few of Doolittle's Black Cap for early, and then a good supply of the Mammoth Cluster and the Philadelphia. Set them in rows six feet apart and cultivate with a horse and cultivator. Currants should be set at least six feet apart each way.

I think none of the new varieties are equal, all things considered, to the old red and white Dutch. If reasonably well cared for, a good crop is almost a certainty. My bushes have been in bearing twenty years, and in that time have never failed to give us a nice crop, and never a better one than last season.

Grapes, in the number of varieties, exceed all the small fruits except strawberries. There are a few of the standard varieties that it is safe to set, and with fair care we may expect to be successful. The Janesville is the earliest. Two years since mine were all ripe and picked in August. It was their first bearing season, and, of course, there were but few of them. In quality they are not first

rate; vine hardy and a good bearer. The Delaware is perfectly at home in the Fox river valley, and will do well with a fair chance. It is a slow grower for the first two or three years, but bears well after it gets at it. This stands at the head of the list of table grapes for at least all the country this side the Rocky mountains. The Concord is too well known to be more than mentioned. The Worden is a new variety that promises well with us. Rogers' No. 3, No. 4. No. 9, No. 10, No. 15, and No. 19, are all good, and with the others named will make up a list of grapes from which you may have a constant supply of this delicious fruit from the fifteenth of August until the first of the following April.

The wild blackberries are generally so plenty and so good, that it is useless for us to try to compete with them. All of the above named fruits, except the currant, are much better for being slightly covered in the winter. To keep up a constant supply of the best of strawberries, a new bed should be set at least every other year. Raspberries if properly cared for, will last from six to ten years. Currants and grapes will last a long time, and continue in good condition when treated well.

Gentlemen, I have in a very hasty manner been over the list of common vegetables and fruits, such as every farmer might and ought to have, and have them, not as a rarity and a luxury, but as an every day dish, and as plenty and as free for yourselves, your families and your friends, as are the beans, pork, potatoes and bread and butter, with which your tables are so well laden. I do not believe that the majority of our farmers can afford to do without a good garden. There is not another acre of land upon your farm that will pay as well as the one donated to a garden, provided, it is well cared for. But it must not be left to care for itself, nor must it be left to be cared for nights and mornings, when you are either in too much of a hurry or too tired to do the work well. Neither must it be left for rainy days, or days when there is nothing else to do. Let it be thoroughly understood that it is to be properly cared for, and at the proper time, just as much as your wheat, your corn, or your cows are cared for. With this plan adopted and carried out, it would only be a short time before you would wonder how you ever got along without a good garden. In this matter I am not speaking at random or by guess. Many years' experience with a large family about me, has told me of its great

comfort, as well as its value. With good vegetable and fruit gardens, your homes will be more pleasant, as well as more valuable, not only to yourselves, but to your families and friends, than you can possibly make them without such comforts and luxuries.

The discussion which ensued on the reading of the president's paper was participated in by many of the members, and was exceedingly interesting. It was conducted with no restraint or formality, and in a highly conversational manner, yet without confusion. Nearly every proposition in the paper called forth observations and experiences from members of the society; and though the discussion was so discursory that the secretary finds it difficult to make marked points in the record, yet manifestly the members found many marked points of interest and instruction to appropriate to their individual benefit.

This concluded the papers and discussions.

The question of a programme for the next meeting was taken up and considered.

Moved and carried that the president be authorized to procure a speaker from abroad, if possible, to deliver a formal address on some topic, at his option, connected with the objects of the society.

Moved and,carried, that if the president does not succeed in obtaining an address, the subject of Noxious Weeds be the principal matter of consideration, and that Mr. Van Auken be appointed to open the discussion either by written or extemporaneous remarks, at his pleasure.

The time and place of the next meeting being under consideration, Mrs. C. J. Lawrence, of Howard, generously extended to the society an invitation to meet at her house or on her premises. The invitation was accepted; it was moved and carried that our next meeting be a picnic, to be held on the premises of Mrs. C. J. Lawrence in the town of Howard, on Saturday, the thirty-first of May, ensuing.

Resolved, That the thanks of the society be extended to Mr. and Mrs. Rowbotham for the generous and ample provision made for the accommodation and comfort of the society at the present meeting.

The society then adjourned to the time and place above named.

Werden Reynolds,
Secretary.

FREEDOM HORTICULTURAL SOCIETY.

This society has at present fifty-four members, with a small balance in the treasury. At the annual meeting held January 21, 1879, the following officers were chosen:

President — Charles Hirschinger, Baraboo.

Vice President — M. T. Nippart, Baraboo.

Secretary — Charles Clark, North Freedom.

Treasurer — A. Bender, Baraboo.

Executive Committee — S. D. Slentz, L. T. Albee, J. M. Haynes, North Freedom.

GRAND CHUTE HORTICULTURAL SOCIETY.

The members of this society manifest an increasing interest in horticulture. It is thought more fruit trees will be set in this locality the coming spring than for some time past, notwithstanding the great discouragement from the loss of fruit trees by severe winters, blight and the "worms."

There is much reason to hope that by thorough investigation and diligent labor, we shall conquer all difficulties, learn the cause and the remedy for our failures, and find at last, in some old or new varieties, the trees and the manner of culture that will give us reliable apples. More attention is being paid to small fruits than formerly; many are setting strawberries, and a few the Blackcap raspberry. Some have planted ornamental trees the past year, mostly evergreens. The discussions in our meetings indicate that some thought has been given to landscape gardening. The greater part of the last meeting was devoted to floriculture; several ladies were present and took part. The society voted to hold four meetings the present year. At the annual meeting the following officers were elected:

G. G. Johnston, *President.*

L. L. Randall, *Treasurer.*

Mrs. D. Huntley, *Secretary.*

MRS. D. HUNTLEY,
Secretary.

Appleton, *March* 15, 1879.

The Grand Chute Horticultural Society held an exceedingly pleasant meeting at D. Huntley's, on Saturday evening, March 15. The president being absent, L. L. Randall presided.

At the request of the members a new constitution had been prepared, which was read and adopted. Several new members were added to the society, most of them ladies.

Mrs. O. Forward, of Lawrence University, read the following paper, illustrating the refining and elevating influence of flowers, and their superior beauty as ornaments, compared with gold, silver or jewels:

FLOWERS—THEIR INFLUENCE.

Friends: You did not ask me to write a romance to read to you to night. Something was said about a practical paper upon the treatment of the Calla lily; how to coax that fair exile into such forgetfulness of the balmy atmosphere and vaporous mornings of tropical and semi-tropical lands, that, he will unfold a monthly miracle of creamy blossoms in the face of a fickle Wisconsin summer; but, alas! kind listeners, my poor calla took her death of cold sometime after the holidays, when the fireman, not quite so tireless as Phœbus Apollo, went to sleep and forgot the furnace; and my own steam pipes (Alas! that "my own fireside" has gone out of fashion) wailed a note or two of alarm that I did not hear, and then sank far below zero. In the morning I found my pet and pride lying stark and cold over the edge of the flower pot. I mournfully removed her limp and useless members, and, although the soil in the pot was frozen hard, I did not cease to hope against hope that the blessed, immortal principle of life still nestled at the heart of my lily bulbs. I did not hope in vain. A few weeks ago my pretty lady came in for a resurrection. I had set her away in a dark, dry place, only occasionally giving her a regretful side-glance, when, "after many days" a slender point of green appeared cleaving the dark soil. I joyfully placed her in the sunshine, and gave her plenty of warm water, and most rapidly did she push up her vigorous leaves and spread them out like broad, green banners in the sun of an eastern window, and just now, a stout bud is pointing its way out of the enveloping leaf-stalk; and I shall have my first calla blossom to decorate my breakfast table on all-fool's day, if my plant

does not enter into league with mischievous mortals and play me April fool!

The lesson drawn from this little experience is this: if you want your callas to blossom in summer, let them rest in winter. Do not freeze them as I did mine, lest your experiment result more disastrously, but try some more humane plan. I say *humane*, for I cannot quite get rid of the notion that plants are sentient beings, and can be hurt and wronged by our cruelty and neglect, just as human things are. This notion may be somewhat more fanciful and poetical than practical; but when a young girl once said to me, "I don't like wax flowers, they hav'nt any soul," I understood perfectly what she meant. He who lives in growing sympathy with nature, feels year by year a diviner kinship with the trees and flowers, and all the revelations of life above him and below him. No wonder the royal lover of the orient believed that the soul of his dead mistress blossomed again for him in the white lily, or that the poet king made the church say of her absent beloved, "He feedeth among the lilies." Many a lesser soul since then has cried out in substance if not in words:

O buds, fold over and over
Your secret so old and so new;
'Tis a sense that the soul can discover
The same both in me and in you.

O mosses, cling closer and kinder
By ways of the wood and the wind;
Your lesson is faith to the finder
And sight to the blind.

O life, you may sweetly dissemble
And hide in the fruit of the vine;
My lips shall yet taste you and tremble
And answer the mystical sign.

No one who does not get some glimpses of the other side of things, can comprehend the higher meanings of the "things that are seen." To the true lover of the flowers, the pansy, the rose, the lily, is something more than a thing or even a flower; it is a divine revelation of the beauty that most of us believe to be immortal and eternal. Is it any wonder that through the influence of flowers, hard hearts have grown tender and gentle, dark lives, fair

and beautiful, that children have grown up refined and lovely, and that men and women everywhere have been lifted into a broader, sweeter life? Flowers seem to know the eyes that love them, and the hands that touch them caressingly, and they return this love and pains a thousand fold in beauty and fragrance.

But there, how I have digressed. I never could keep to the practical out of the school-room. I sympathize with those erratic souls who are continually flying off on tangents of philosophy, poetry and the transmigration of souls. I commenced to make some suggestions about the treatment of the Calla lily in order to secure blossoms out of season, which the botany says is January or February; but which, it seems to me, might be any other month, provided the plant were kept dormant and only set growing in time to secure maturity against the time predetermined for blossoming.

I remember that once in the city I started out to purchase a wedding present for a fair young bride about to be. "My present," I said to myself, "shall possess three requisites; it must be beautiful and appropriate and must cost" — I thought of my flat purse and made a rapid estimate of the week's board and laundry bills — "must cost only a dollar." You smile at the thought of a wedding present that cost only a dollar; a wedding present too that must take its rank among silver and gold and bridal jewels, among rare books and pictures, delicate china and vases, and all the costly and fragile ornaments that a fashionable wedding in that most proper of proper cities, Philadelphia, was wont to call forth a few years ago, before a display of wedding presents fell into disrepute. As I turned a corner leading to S——— street, a humble green-house met my eye, before the door of which a hunch-back, watering-pot in hand, was sprinkling some plants. My good angel must have prevailed, for I turned aside to speak to the little orist, who, with a politeness almost courtly, invited me in to see his treasures. His conservatory was small and low, and the great business blocks crowded and overshadowed him; but somehow the blessed sunshine had found him out and wrought such miracles in that narrow place as I have seldom seen in the conservatories of the rich. The little man was a botanist, too, and his manner so gentle and refined, his conversation so learned and interesting, and withal he was so simple and unconscious, that I forgot his

poor dwarfed and crippled body, and it seemed to me there was only one deformity in all the world worth deploring, and that, deformity of soul. As to the body, that might be transfigured. And here a stanza of dear Mrs. Howe's Battle-hymn of the Republic came singing in my heart:

> "In the beauty of the lilies, Christ was born across the sea,
> With a glory in his bosom that transfigures you and me."

It was in the latter part of the month of September, but I found a calla bearing magnificent leaves, one great, white, perfect chalice and two buds. Would the little man sell it? I scarcely thought he would, but finally summoned the courage to ask him. Yes, I might have it for a dollar; he had several others in the other room as fine as that. I bought it eagerly and was too over-glad to ask the secret of this September blossoming. The next day, the great day of the feast, my lily stood in the very centre of a large table laden with brilliant gifts, and looked more regal than they all. I was not ashamed of my wedding present, and as I turned my eyes from gold and jewels up to this queen lily of Flora's realm, I thought truly "Solomon in all his glory was not arrayed like one of these." If I ever see the little botanist of S—— street, I shall find out how to make callas blossom in every month of the year, for I am sure he knows. He has what the Germans call "Zeitgeist." He sees into the very heart of things, and like Carlyle's "Teufelsdrocke" with his quick tympanum hears the grasses grow. The pretty sequel to my story is that my wedding present has a namesake, an honor which none of the costlier gifts have won. The happy couple have named their baby daughter Lily, after my flower.

It is always appropriate to close a romance with the murder of your hero, the marriage of your happy couple, or the birth of their first child; but I propose to spin my story out long enough to tell you that this is not the story that I set out to tell in the beginning. I thought to say a little about calla lilies, then, because I knew so little to say; I hoped to mask that little by a brief account of a noble hearted mother whom I know, living in the midst of her little children, in the eastern part of my own state, just where the Pennsylvania mountains reach across the line to clasp hands with Ohio hills. This true gentlewoman, through the influence of flowers and the thirst for knowledge which their culture brings, has

elevated and improved a whole community. Twelve years ago there was scarcely a flower-garden in the hamlet; now every yard, however broad or narrow, is glorified by the choicest annuals and perennials, and in every cottage window bloom those rare and fragile things that turn winter into summer. The story paper has given way to the Ohio Farmer or the Agriculturist, the botany is fast supplanting the yellow covered novel, and useful research and intelligent conversation leave little room for idle gossip; and all this, the work of one woman who had the taste and tact to appeal to the love of the beautiful in the hearts of her neighbors. Does this not suggest that there is more than one way of doing good?

With this hint, and an apology for the fragmentary character of this paper, resulting, I suppose, from what Victor Hugo calls the "promiscuity of things," in other words, the too close proximity of Latin derivatives and horse shoe geraniums, of French verbs and prickly cacti, Cataline's conspiracy and the slow developments of the scale-bug. I leave you to recall, if you are ingenious enough, anything that I have said about the Calla lily.

L. L. Randall followed with a paper on the orchard, giving his experience with seedling trees, which promise to be very successful. He has about two hundred seedlings from the Duchess of Oldenburgh, all in fine condition; three or four of them have come into bearing, and the fruit has four of the seven qualifications desired to meet the wants of fruit growers in the northwest, viz: hardiness, early bearing, prolific and annual bearer, size, color, quality, and a long keeper. Mr. Randall is very confident that he shall "bring out the apple that will complete the list of iron clads."

The oldest member present (Mr. Hart) has been in the state twenty-seven years; has had a severe experience with apple trees, and has lost faith in all "iron clads," but still hopes there will be some new variety found that will prove reliable in northern Wisconsin.

To fill vacancies in orchards, one member recommended Golden Russet and Tallman Sweet as the best varieties. Another would set the ten hardy varieties, viz: Red Astrachan, Tallman Sweet, Duchess of Oldenburgh, Fameuse, St. Lawrence, Utter's, Plumb's Cider, Seek-no-Further, Golden Russet, Ben Davis — planting seventy-five per cent. winter apples, and would fill vacancies with

these hardy varieties, adding a few "Sops of Wine," and two or three "Saxton's" for family use.

It was remarked that stony land was best adapted to the orchard, and like conditions may be gained by underdraining. It was the opinion of those present that fruit can be raised very successfully in this county, and that any apple crop in this locality, however large, will always sell at remunerative prices. Small fruits are receiving more attention than formerly, particularly strawberries; these are easily grown, and besides being very desirable for home use, they are a profitable crop at ten cents a quart, either for this or the southern market, where our best berries would come in competition with their poorest, and possibly might supply a demand when the southern crop was exhausted.

The discussion of the Tent Caterpillar was unfortunately deferred, but will be taken up at the next meeting of the Farmers' Industrial Association. It is very important that all who have fruit trees should give immediate attention to the destruction of this pest. There is much reason to fear it will be more destructive this year than last, unless exterminated the present spring.

Seeds from the department of agriculture were distributed.

Adjourned to meet in the city in June, at the residence of A. Stone, proprietor of the Appleton Green House. The time and subjects will be previously announced.

MRS. D. HUNTLEY,
Secretary.

JANESVILLE HORTICULTURAL SOCIETY.

The following officers were elected to serve for the coming year:

President — F. S. Lawrence.

Vice President — George J. Kellogg.

Secretary — E. B. Heimstreet.

Treasurer — D. E. Fifield.

Executive Committee — E. G. Fifield, A. Hoskins, A. D. Wickham, J. B. Whitney, M. D.; G. H. Williston, E. G. Dimock.

Delegates to State Society — F. S. Lawrence, G. J. Kellogg.

President's report shows no debts, and a balance in treasury of $86.00.

At the Rock county fair of 1878, the horticultural department was one of the main features of the fair; the buildings being well filled, and the display of fruits and flowers very fine. In the fruit department was noted especially those of G. J. Kellogg, F. S. Lawrence, W. Palmer, A. Hoskins. In plants and flowers, Mrs. F. S. Lawrence, H. G. Roberts, O. P. Freeborn, had fine assortments. The ladies of this city are now taking a good deal of interest in flowers, and the prospect is that more interest than ever will be taken this year in small fruits, plants and flowers.

E. B. Heimstreet,
Secretary.

LEMONWEIR VALLEY HORTICULTURAL SOCIETY.

Officers elected for the ensuing year, January 20, 1879:
President — C. N. Holden.
Vice President — Wm. Moore.
Secretary — I. G. Parker.
Treasurer — P. C. Colver.
Executive Committee — Anson Wright, J. J. Kibbie, J. Baylan.
Librarian — Mrs. Goodhue.
Delegate to State Convention — C. W. Potter.

I. G. Parker,
Secretary.

SAUK COUNTY HORTICULTURAL SOCIETY.

This society was never in a more flourishing condition than at present. The membership has increased to over one hundred, the finances are free from embarrassment, and the community manifests a growing interest in its development and prosperity. A very successful festival was held at Baraboo, in June, 1878, on which occasion the State Horticultural Society met with us.

At the annual meeting in January, 1879, the following officers were elected for the ensuing year:

President — William Toole.
Vice President — J. W. Wood.

Recording Secretary—Mrs. M. M. Davis.

Corresponding Secretary — Mrs. E. E. Woodman.

Treasurer — William C. Warner.

Executive Committee — Charles Hirschinger, Samuel S. Grubb, Mrs. Bevie Clarke, Mrs. D. D. Doane, and Mrs. C. E. Ryan.

MRS. E. E. WOODMAN,
Secretary.

WAUPACA COUNTY HORTICULTURAL SOCIETY.

Our society was organized about five years ago. We have over thirty members. We have two regular meetings each year; one in March, at which our officers are chosen, and one in September, for the exhibition of fruits and the discussion of appropriate questions, generally closing with an old fashioned, rural picnic, making it a very desirable meeting for the members and their wives.

At our March meeting, just held, our president had four varieties of his well known seedlings—the Weyauwega, Wrightman, Flora and Wrightman's Blush—all in good condition; all good flavor and hardy.

Probably no county in the state has beat ours in originating valuable apples. In addition to those already given, we have the Martha, Rich's Greening, Balch, Albert, and last, but not *least*, by any means, the Wolf River, a pumpkin in size, but not in flavor. Friend Springer has in his nursery several other seedlings that are fine, and may yet prove formidable rivals to some of our popular kinds.

The officers of our society for the coming year are:

President — E. W. Wrightman, Weyauwega.

Vice President — J. A. Mathews, Weyauwega.

Secretary — J. Wakefield, Fremont.

Treasurer — Wm. Masters, Royalton.

Executive Board — W. A. Springer, chairman; O. A. Rich, John Mack.

Grapes do well in our county, and some valuable kinds are being extensively cultivated.

Ours is not a climate for plums, and our people have given up the idea of wasting money on them.

J. WAKEFIELD,
Secretary.

STATISTICS IN RELATION TO FRUIT AND TIMBER

in the several counties of the state of Wisconsin in 1877 *and* 1878, *as taken from the town assessors' returns.*

COUNTIES.	APPLE ORCHARD.			VINEYARD.		CRANBERRIES.		GROWING TIMBER, 1878.
	Number of acres, 1878.	Number of trees bearing age.	Number of bushels, 1877.	Number of acres, 1878.	Number of pounds, 1877.	Number of acres 1878.	Number of bushels 1877.	
Adams	127	3,682	133	.....	144	63	129	61,766
Ashland	.....	.....	.....	.....	.....	.....	.....	1,152,000
Barron	63	1,059	45	.....	10	.....	.....	313,706
Bayfield	.....	.....	.....	.....	.....	.....	.....	500,000
Brown	171	8,137	1,236	.....	320	.....	.....	87,368
Buffalo	110	5,665	229	4	7,210	.....	.....	14,317
Burnett	2	200	2	.....	.....	3,360	4,000	2,719
Calumet	452	14,133	570	4	566	.....	.....	67,331
Chippewa	59	3,582	283	....	.....	412	2,595	940,200
Clark	121	2,893	205	.....	650	20	8	679,150
Columbia	2,312	70,922	7,429	26	5,050	27	553	77,980
Crawford	831	25,896	1,312	4	225	.....	.....	88,198
Dane	3,290	99,498	7,984	67	36,409	.....	.....	104,876
Dodge	2,717	93,842	17,980	591	2,985	37	20	52,069
Door	199	3,900	345	.....	1,224	6	.....	26,834
Douglas	.....	.....	.....	.....	.....	.....	.....	170,000
Dunn	127	4,558	263	.....	.....	1	1	108,640
Eau Claire	103	4,853	751	.....	100	.....	.....	41,072
Fond du Lac	3,009	94,036	8,273	.....	661	.....	.....	40,797
Grant	2,598	119,596	7,098	54	176,341	.....	.....	161,172
Green	1,315	52,970	2,471	4	5,660	.....	.....	64,963
Green Lake	1,388	45,828	3,965	.....	513	47	24	24,337
Iowa	1,016	36,892	1,407	14	30,380	.....	.....	71,243
Jackson	106	3,496	275	1	2	12,990	3,578	100,801
Jefferson	2,481	87,240	15,256	36	81,617	.....	40	35,781
Juneau	424	10,066	585	5	420	2,510	10,312	46,447
Kenosha	1,744	66,622	9,793	.....	1,101	.....	.....	12,300
Kewaunee	123	4,132	256	.....	470	.....	.....	47,995
La Crosse	315	8,260	190	4	425	.....	.....	34,236
La Fayette	1,463	57,159	2,863	1	2,480	.....	.....	57,106
Lincoln	2	35	.....	.....	.....	.....	.....	691,000
Manitowoc	999	21,549	1,980	.....	156	.....	 4	158,534
Marathon	7	1,200	34	.....	.....	.....	.....	861,192
Marquette	506	10,984	815	3	475	259	363	53,142
Milwaukee	2,110	53,173	26,456	5	5,725	.....	.....	15,410
Monroe	533	13,162	1,430	2	1,376	817	9,149	51,469
Oconto	12	565	56	.....	.....	.....	.....	1,532,197
Outagamie	591	17,231	372	1	498	1	15	80,511
Ozaukee	1,421	18,277	2,768	.....	.....	.....	.....	22,274
Pepin	19	2,882	108	.....	.....	.....	.....	41,749
Pierce	210	5,554	379	.....	.....	.....	.....	160,662
Polk	215	1,265	20	.....	.....	.....	20	47,428
Portage	131	3,793	89	.....	.....	49	3,150	325,489
Racine	4,447	78,370	23,994	4	5,760	.....	10	14,983

Statistics in relation to Fruit and Timber — continued.

COUNTIES.	APPLE ORCHARD.			VINEYARD.		CRANBERRIES.		GROWING TIMBER, 1878.
	Number of acres, 1878.	Number of trees bearing age.	Number of bushels, 1877.	Number of acres, 1878.	Number of pounds, 1877.	Number of acres, 1878.	Number of bushels, 1877.	
Richland	600	13,233	970	8	2,390	.....	.....	185,000
Rock....	3,944	134,282	7,310	19	31,634	.....	.....	57,105
St. Croix	392	8,616	322	.....	.....	4	11	99,034
Sauk.....	1,617	37,369	1,704	37	26,545	2	339	134,789
Shawano	70	1,330	45	.....	29	142	225	161,890
Sheboygan ...	2,302	81,215	16,811	.....	270	6	7	73,979
Taylor	.....	2	.....	.....	.....	1	.....	621,720
Trempealeau ..	335	10,456	864	.....	374	1	.....	42,563
Vernon	1,058	20,691	999	13	783	8	80	147,241
Walworth	4,091	132,159	22,923	6	9,899	.....	12	49,453
Washington ..	2,201	67,692	18,015	.....	1,000	50	88	57,087
Waukesha....	3,592	109,529	37,505	5	6,620	40	64	49,989
Waupaca.....	300	10,195	341	.....	97	81	345	141,579
Waushara	290	8,891	350	.....	3,169	802	36,486	61,828
Winnebago ...	1,291	47,088	6,339	4	3,725	100	.....	19,688
Wood	73	786	33	.....	.....	3,205	545	84,882
	61,819	1,840,572	264,238	925	455,210	25,041	72,173	11,229,194

SUMMARY OF METEOROLOGICAL OBSERVATIONS FOR THE YEARS 1869–1878.

Taken at the University, Madison, Wis.

JANUARY, 1869–1878.

YEAR.	TEMPERATURE IN OPEN AIR.			BAROMETER, HEIGHT REDUCED TO 32°.			RAIN AND SNOW.		SATURATION.
	Max.	Min.	Mean.	Max.	Min.	Mean.	Inches rain and melted snow.	Inches snow.	
1869	42.0	−11.0	23.7	29.559	28.206	28.961	2.69	16.25	94
1870	40.0	−12.0	17.8	29.438	28.088	28.893	3.25	11.00	82
1871	55.0	−2.0	20.7	29.493	28.319	28.994	2.32	20.0	67
1872	40.0	−15.0	17.5	29.398	28.424	28.916	1.20	12.0	74
1873	33.0	−21.0	10.9	29.327	28.074	28.850	1.40	12.5	98
1874	57.0	−12.0	18.9	29.575	28.203	28.978	3.64	24.0	90
1875	33.0	−25.0	3.6	29.439	28.618	29.073	0.90	.....	97
1876	46.0	−6.0	24.5	29.455	28.103	28.934	2.31	.....	91
1877	43.0	−16.0	12.9	29.500	28.700	29.067	1.00	.....	87
1878	36.7	−9.0	25.1	29.039	28.497	28.736	0.40	4.0	90

Summary of meteorological observations for the years 1869–1878—continued.

FEBRUARY, 1869–1878.

YEAR.	TEMPERATURE IN OPEN AIR.			BAROMETER, HEIGHT REDUCED TO 32°.			RAIN AND SNOW.		Saturation.
	Max.	Min.	Mean.	Max.	Min.	Mean.	Inches rain and melted snow.	Inches snow.	
1869	50.5	−1.0	22.9	29.464	28.453	28.932	2.35	8.0	89
1870	38.0	−15.0	20.9	29.321	28.000	28 871	1.35	2.0	88
1871	46.0	−4.0	23.7	29.396	28.104	28.859	1.43	10.0	87
1872	48.0	−10.0	19.2	29.356	28.195	28.889	0.40	3.0	88
1873	40.0	−20.0	15.6	29.358	28.237	28.857	0.60	6.0	95
1874	41.0	−10.0	21.0	29.515	28.136	28.995	0 95	9.0	91
1875	27.0	−21.0	3.4	29.569	28.357	28.955	2.80	.....	83
1876	51.0	−12.0	24.3	29.443	28.417	28.931	1.60	.....	91
1877	52.0	15.0	32.6	29.560	28.472	29.108	0.30	.....	86
1878	44.7	21.5	32.8	29.088	28.267	28.655	1.19	5.5	82

MARCH, 1869–1878.

1869	59.0	−8.0	25.5	29.659	28.162	28.947	0.49	5.0	85
1870	42.0	−8.0	27.0	29.510	28.376	28.934	3.85	17.0	85
1871	60.0	20.0	35.4	29.210	28.138	28.814	2.96	.....	75
1872	40.0	3.0	23.8	29.474	28.431	28.758	2.18	22.0	82
1873	52.0	−5.0	30.8	29.579	28.227	28.886	2.07	10.0	75
1874	47.0	10.0	29.7	29.426	28.121	28.935	0.95	2.0	69
1875	64.0	1.0	25.1	29.291	28.030	28.826	0.90	.....	70
1876	58.0	0.0	27.8	29.417	28.064	28.955	2.27	.....	93
1877	54.0	−2.0	23.2	29.331	28.049	28.988	3.40	.....	84
1878	60.3	31.7	44.0	28.899	28.218	28.614	2.43	.....	73

APRIL, 1869–1878.

1869	63.0	12.5	36.7	29.467	28.371	28.868	2.72	6.0	75
1870	78.0	−2.5	49.7	29.302	28.600	28.949	0.18	.....	54
1871	82.0	33.0	46.0	29.168	28.071	28.692	2.10	.....	61
1872	77.0	23.0	45.8	29.345	28.242	28.870	1.82	8.0	56
1873	80.0	29.0	42.4	29.148	28.352	28.801	1.26	9.0	66
1874	63.0	13.0	36.8	29.347	28.472	29.031	1.26	1.0	66
1875	62.0	11.0	43.3	29.196	28.182	28.882	1.87	.....	68
1876	66.0	30.0	49.4	29.336	28.343	28.880	2.65	.....	72
1877	74.0	18.0	45.3	29.354	28.360	28.977	.....	.....	74
1878	64.7	43.0	52.3	28.774	28.083	28.482	2.97	.....	67

Summary of meteorological observations for the years 1869–1878—continued.

MAY, 1869–1878.

YEAR.	TEMPERATURE IN OPEN AIR.			BAROMETER, HEIGHT REDUCED TO 32°.			RAIN AND SNOW.		SATURATION.
	Max.	Min.	Mean.	Max.	Min.	Mean.	Inches rain and melted snow.	Inches snow.	
1869	81.5	35.0	54.4	29.259	28.392	28.830	4.9	.....	73
1870	85.0	45.0	65.0	29.136	28.289	28.853	1.09	.....	52
1871	86.0	38.0	61.0	29.211	28.680	28.909	3.31	.....	61
1872	79.0	39.0	57.5	29.225	28.412	28.855	2.83	.....	61
1873	76.0	39.0	55.2	29.369	28.473	28.842	3.53	.....	66
1874	90.0	42.0	59.4	29.126	28.454	28.893	2.14	.....	67
1875	83.0	31.0	59.0	29.443	28.137	28.858	2.61	.....	58
1876	83.0	36.0	59.5	29.321	28.601	28.969	5.18	.....	69
1877	83.0	34.0	60.7	29.398	28.542	28.991	1.02	.....	73
1878	68.3	39.2	54.6	28.889	28.247	28.610	4.64	.....	70

JUNE, 1869–1878.

1869	78.5	48.0	62.5	29.199	28.240	28.868	6.24	.....	74
1870	98.0	53.0	71.2	29.149	28.563	28.911	1.92	.....	57
1871	89.0	54.0	69.3	29.519	28.631	28.900	4.93	.....	62
1872	90.0	55.0	67.0	29.248	28.409	28.858	2.44	.....	64
1873	89.0	55.0	73.0	29.217	28.458	28.862	5.60	.....	68
1874	92.0	54.0	63.3	29.451	28.498	28.878	2.85	.....	78
1875	80.0	51.0	64.1	29.173	28.564	28.793	3.37	.....	75
1876	87.0	42.0	68.2	29.068	28.421	28.801	4.57	.....	77
1877	81.0	47.0	65.9	29.092	28.589	28.866	4.77	.....	79
1878	78.3	51.3	65.8	28.943	28.358	28.650	4.20	.....	69

JULY, 1869–1878.

1869	80.0	59 0	69.5	29.689	28.242	28.951	3.63	.....	73
1870	91.0	58.0	73.8	29.150	28.638	28.888	5.25	.....	64
1871	90.0	56.0	71.1	29.373	28.662	28.928	2.11	.....	59
1872	92.0	60.0	73.4	29.075	28.622	28.892	1.26	.....	65
1873	91.0	53.0	71.7	29.157	28.657	28.928	0.82	.....	68
1874	96.0	62.0	75.4	29.173	28.666	28.967	5.19	.....	63
1875	86.0	62.0	73.0	29.238	28.622	28 955	0.97	.....	71
1876	89.0	61.0	74.5	29.187	28.709	28.930	4.14	.....	70
1877	83.0	57.0	73.0	29.275	28.687	28.921	3.84	.....	73
1878	86.3	64.5	74.9	28.848	28.408	28.681	7.56	.....	73.6

Summary of meteorological observations for the years 1869–1878 — continued.

AUGUST, 1869–1878.

YEAR.	TEMPERATURE IN OPEN AIR.			BAROMETER, HEIGHT REDUCED TO 32°.			RAIN AND SNOW.		Saturation.
	Max.	Min.	Mean.	Max.	Min.	Mean.	Inches rain and melted snow.	Inches snow	
1869	89.0	54.0	66.9	29.417	28.385	29.014	5.92	.....	79
1870	89.0	56.0	67.1	29.253	28.557	28.926	3.65	.....	65
1871	91.0	52.0	69.8	29.180	28.389	28.915	3.35	.....	68
1872	90.0	53.0	70.4	29.124	28.691	28.949	2.24	.....	67
1873	91.0	58.0	71.9	29.234	28.736	28.957	2.76	.....	69
1874	93.0	58.0	71.1	29.177	28.678	28.970	1.40	.....	65
1875	86.0	52.0	69.6	29.440	28.626	28.947	2.57	.....	71
1876	90.0	56.0	73.1	29.189	28.712	28.960	3.42	.....	72
1877	86.5	59.0	67.8	29.156	28.508	28.842	3.76	.....	69
1878	78.0	64.8	72.2	28.774	28.475	28.612	4.28	.....	71

SEPTEMBER, 1869–1878.

1869	81.0	39.0	61.8	29.400	28.798	29.033	2.68	.....	73
1870	83.0	54.0	61.2	29.279	28.772	29.030	4.00	.....	54
1871	88.0	40.0	59.8	29.352	28.664	29.045	0.47	.....	56
1872	89.0	39.0	62.1	29.240	28.469	28.854	5.11	.....	71
1873	87.0	40.0	55.4	29.317	28.506	28.930	2.54	.....	67
1874	90 0	46.0	64.4	29.196	28.535	28.961	5.46	.....	73
1875	81.0	36.0	58.9	29.374	28.525	29.009	2.06	.....	66
1876	79.0	36.0	59.8	29.168	28.247	28.835	3.41	.....	77
1877	86.0	47.0	65.8	28.934	28.456	28.705	0.64	.....	71
1878	77.7	49.0	62.9	29.051	28.405	28 722	6.54	.....	70

OCTOBER, 1869–1878.

1869	71.0	16.5	37.7	29.361	28.570	28.954	0.66	.....	65
1870	70.0	29.0	50.4	29.263	28.474	28.956	2.09	.....	75
1871	80.0	27.0	52.0	29.247	28.372	28.885	3 07	3.0	48
1872	76.0	30.0	49.0	29.344	28.511	28.971	0.60	.....	61
1873	73.0	20.0	45.1	29.329	28.502	28.914	1.96	7.0	68
1874	71.0	30.0	51.0	29.404	28.391	28.848	1.41	.....	76
1875	77.0	27.0	46.1	29 344	28.380	28.930	1.96	.....	63
1876	66.0	23.0	45.8	29.232	28.420	28.853	1.59	.....	74
1877	78.0	33.5	51.2	28.974	28.396	28.702	4.12	.....	75
1878	67.7	28.2	49.6	29.337	28.534	28.959	3.78	3.9	67.8

Summary of meteorological observations for the years 1869–1878 — continued.

NOVEMBER, 1869-1878.

YEAR.	TEMPERATURE IN OPEN AIR.			BAROMETER, HEIGHT REDUCED TO 32°.			RAIN AND SNOW.		Saturation.
	Max.	Min.	Mean.	Max.	Min.	Mean.	Inches rain and melted snow.	Inches snow.	
1869	60.0	11.0	30.1	29.342	28.341	28.862	2.05	13.0	82
1870	64.0	19.0	38.6	29.368	28.278	28.294	0.53	.....	67
1871	58.0	3.0	30.9	29.338	28.536	28.965	2.31	6.0	74
1872	54.0	—4.0	27.2	29.307	28.465	28 900	0.76	2.0	85
1873	50.0	2.0	28.2	29.388	28.204	28.886	2.15	19.0	85
1874	69.0	—3.0	32.6	29.501	28.104	28.970	3.29	4.4	77
1875	54.0	—11.0	31.0	29.525	28.392	28.987	0.40	.....	81
1876	56.0	14.0	35.6	29.293	28.463	28.929	2.31	.....	84
1877	47.3	11.3	34.7	29.100	28.193	28.724	2.81	9.5	77.5
1878	58.0	—8.0	46.7	29.383	28.591	29.017	0.76	.....	....

DECEMBER, 1869-1878.

1869	39.5	—2.5	22.3	29.665	28.514	28.993	2.64	12.0	89
1870	48.0	—13.0	22.1	29.391	28.141	28.910	0.67	4.0	87
1871	39.0	—15.0	13.4	29.325	28.141	28.926	1.15	12.0	87
1872	38.0	—28.0	9.5	29.542	28.306	29.043	1.69	16.0	96
1873	43.0	2.0	26.0	29.388	28.152	28.998	1.80	12.0	88
1874	50.0	—15.0	22.6	29.598	28.467	28.977	0.45	.....	84
1875	54.0	—11.0	31.9	29.151	28.094	28.790	2.18	.....	87
1876	38.0	—22.0	11.1	29.635	28.415	29.064	2.59	.....	90
1877	56.7	22.7	38.7	28.994	28.295	28.750	2.01	0.5	77.5
1878	39.0	—8.0	22.1	29.485	28.417	28.963	0.79	.....	....

ERRATA.

In the twentieth line from the top of page 180, read *quantity* instead of "quality."

On page 181, the eighteenth line from the top should read:

Under our second general division, the geological, the soil.

On the same page, fourth line from the bottom, read *well drained*, instead of "well trained."

On the 184th page, eighteenth line from the top, read *Excessive pruning*, instead of "Exclusive pruning."

Page 317. The head, "Report of a Summer Meeting of the Brown County Horticultural Society," should have been inserted after the tenth line from the top of page 316.

SUMMARY OF METEOROLOGICAL OBSERVATIONS TAKEN AT THE UNIVERSITY OF WISCONSIN

For the Year 1877.

Month.	Thermometer Exposed in Open Air.				Barometer, Height Reduced to 32°.				Inches of rain and melted snow.	Amount of cloudiness.	Percentage of saturation.	Percentage of Winds.							
	Max.	Min.	Mean.	Variation.	Max.	Min.	Mean.	Fluctuation.				S	SW.	W.	NW.	N.	NE.	E.	SE.
January	43	—16	12.9	59	29.500	28.700	29.067	.800	1.00	4.3	87	24	29	21	4	17	2	0	3
February	52	15	32.6	37	29.560	28.472	29.108	1.088	.30	3.7	86	6	7	32	9	37	0	6	3
March	54	— 2	23.2	56	29.331	28 049	28.988	1.282	3.40	4.2	84	11	11	19	9	26	15	2	7
April	74	18	45.3	56	29 354	28.360	28.977	.994	.....	4.5	74	19	5	10	2	36	15	8	5
May	83	34	60.7	49	29.398	28.542	28.991	.856	1.02	3.9	73	49	0	3	2	9	9	23	5
June	81	47	65.9	34	29.492	28.589	28.866	.503	4.77	4.2	79	38	16	15	6	11	3	9	2
July	88	57	73.0	31	29.275	28.687	28.921	.588	3.84	3.1	73	19	16	19	21	8	4	5	8
August	86.5	59	67.8	27.5	29.156	28.508	28.842	.648	3.76	2.9	69	15	12	13	25	23	3	5	4
September	86.0	47	65.8	39	28.934	28.456	28.705	.4 8	.61	3 0	71	23	23	14	11	2	16	2	9
October	78	33.5	51.2	44.5	28.974	28.396	28.702	.574	4.12	6.4	75	3	25	10	24	12	18	2	6
November	49	10	34.7	39	29 126	28.157	28.724	.969	2.81	6.5	77.5	6	25	17	21	18	8	0	5
December	58.5	15	38.7	43.5	29.085	28.401	28.750	.684	2.01	6 3	.....	16	32	1	12	12	17	5	5
Sums	.....	.....	.....	.....	.....	.....	.....	.....	27.67	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Means	.....	.....	47.6	.....	.....	.....	28.100	.....	.....	4.4	.....	19	17	15	12	18	9	5	5
1878.																			
January	36.7	—9.0	25.1	34.0	29.039	28.497	28.736	.542	.40	6.4	90	16	11	1	28	14	24	3	3
February	44.7	21.5	32 8	23 2	29.088	28.367	28.655	.821	1.19	5.6	82	17	15	2	3	43	11	3	6
March	60 3	31.7	44.0	29.6	28.899	28 218	28.614	.681	2 43	5.36	73.2	12	17	4	16	19	7	11	14
April	64.7	43.0	52.3	21 7	28.774	28 083	28.482	.691	2.97	5.5	67	8	22	6	20	11	16	3	14
May	68.3	39.2	54.6	29.1	28 884	28.247	28.610	.637	4.64	5.8	69.9	6	20	11	30	2	7	2	22
June	78.3	51.3	65 8	27.0	28.943	28.358	28.650	.585	4.20	4.9	69.3	15	12	10	10	16	16	6	15
July	86.3	64.5	74 9	21.8	28.840	28.408	28.681	.438	7.56	4 5	73.6	18	10	2	18	19	11	1	22
August	78 8	64.8	72.2	13 2	28.774	28.475	28.612	.299	4.28	3.9	71	6	29	1.5	34	13.5	1.5	4.5	10
September	77.7	49.0	62.9	28.7	29.051	28 405	28.722	.646	6.54	4.0	70	27	14	7	27	6	.....	1	18
October	67.7	28.2	49.6	39.5	29.337	28.534	28.959	.803	3.78	3.85	67.8	24	17	19	27	3	3	1	6
November	58.0	24.0	46.7	34.0	29.383	28.591	29.017	.792	0.76	.....	.....	35	24	22	63	13	27	11.0	15
December	39.0	—8.0	22.1	47.0	29.485	28.417	28.963	1.068	0.79	.....	.....	15	34	60	57	24	18	4	5
Sums	.....	.....	.....	.....	.....	.....	.....	.....	39.56	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Means	.....	.....	49.7	.....	.....	.....	28.725	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

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